Electrophoresis

2003, Dr. Lei Wang

Expansion of the genetic code

Proteins, the molecules that carry out most of the functions required for life, are built from 20 genetically encoded amino acids. In his grand prize-winning essay Dr. Wang describes how he engineered the bacteria *Escherichia coli* to make unnatural amino acids. The biosynthesis strategy mimics the way that the common 20 amino acids are encoded. These additional building blocks allow the design of proteins with new properties.

Dr. Wang received his bachelor's degree in organic chemistry in 1994 and his master's degree in physical chemistry in 1997. At Peking University, he did research in Dr. Zhongfan Liu's laboratory, where he used scanning probe microscopy to investigate the properties of nanoparticles. He went to the United States to pursue graduate studies at the University of California at Berkeley. Under the guidance of Dr. Peter G. Schultz, Dr. Wang developed a general method for genetically encoding unnatural amino acids into proteins in live cells.

GE & Science Prize for Young Life Scientists is supported by GE Healthcare and the journal Science, which is published by AAAS, the nonprofit society.
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www.gelifesciences.com/science

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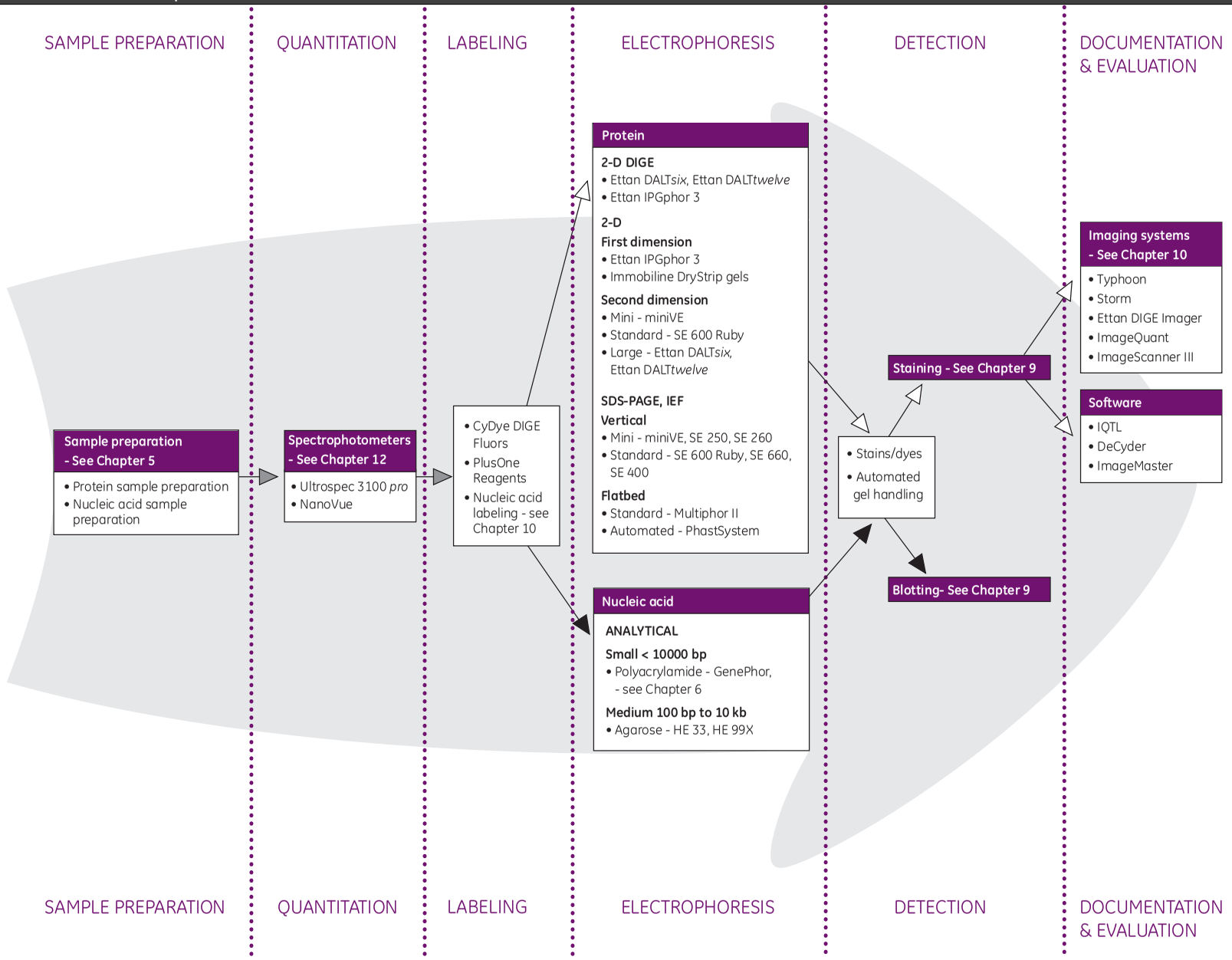
SELECTION GUIDE – Electrophoresis



Introduction to Electrophoresis Tools for Proteome Studies

- ***Identify proteins faster using a comprehensive range of overlapping, Immobiline DryStrip gels that cover narrow (1 pH unit), medium (3-5 pH units) and wide (8 pH units) pH ranges.***
- Choose from two instrument platforms for first-dimension isoelectric focusing (IEF).
- Choose from five instrument platforms for second-dimension SDS-PAGE to meet any format, resolution, or throughput requirement.
- Choose Ettan DALT*twelve* or Ettan DALT*six* for use with 24-cm IPG strips and run up to 12 large-format, precast gels at once.
- Tap into extensive 2-D electrophoresis knowledge and technical support through seminars, workshops, application notes, posters, a 2-D handbook, a video, a dedicated Web site, and other support materials.

Immobiline DryStrip gels for reproducible first-dimension IEF with high resolution and loading capacity
Immobiline DryStrip precast gels with matching IPG buffers simplify performing the IEF step of 2-D electrophoresis. The use of IPG gels delivers high resolution (1) and improved interlaboratory reproducibility (2, 3) compared with classical 2-D electrophoresis using carrier ampholytes. Immobiline DryStrip gels are available in a variety of overlapping pH ranges (seven narrow, five medium, and three broad) and five lengths. The narrow pH range (1 pH unit), 24-cm IPG strips offer the highest resolution and loading capacity available (see page 269).

Two instrument choices for performing first-dimension IEF
Both the new **Ettan IPGphor 3 Isoelectric Focusing System** and the **Multiphor II Flatbed Electrophoresis Unit** are designed to handle, simultaneously, as many as 12 IPG strips up to 24-cm long.

Ettan IPGphor 3 uses innovative strip holders (regular and cup loading) and offers a fast and simple solution for IEF. Ettan IPGphor 3 is a dedicated instrument for Immobiline DryStrip gels. The combination of high voltage, efficient cooling, and ceramic strip holders can reduce IPG strip focusing time to a few hours. Ettan IPGphor 3 accommodates IPG strip lengths of 7, 11, 13, 18, and 24 cm (see page 272).

Multiphor II provides a flexible and economical alternative for performing first-dimension IEF. When equipped with Immobiline DryStrip Kit, which features movable electrodes, Multiphor II can handle essentially any length IPG strip. IEF run times are longer on Multiphor II as compared with Ettan IPGphor 3, but Multiphor II can also be used for flatbed, second-dimension separations (see page 291).

Five choices for second-dimension SDS-PAGE
Choose from five formats for performing second-dimension SDS-PAGE, depending on your throughput and resolution requirements:

For large-format (26 × 20 cm) separations with high throughput, resolution, and reproducibility, choose **Ettan DALT*twelve*** (see page 277) or **Ettan DALT*six* Large Vertical Systems** (see page 274). When used in combination with 24-cm Immobiline DryStrip gels, Ettan DALT systems maximize the number of discrete, quantifiable protein spots obtainable per large-format gel. DALT Gel 12.5, Buffer Kit, and Precast Gel Cassettes deliver reproducible results with high throughput and convenience. Typical separation time is 4–5 h for six gels.

The combination of **Multiphor II Flatbed Electrophoresis Unit** and **ExcelGel** precast SDS acrylamide gels (see page 297) offers a convenient and reproducible method for performing second-dimension separations. IPG strips up to 24 cm can be used with ExcelGel SDS gels. For comparative studies, three 7-cm or two 11-cm IPG strips can be run side-by-side on one gel. Separation time is less than 4 h.

SE 600 Ruby Vertical Unit (see page 287) enables the analysis of several samples under identical conditions. The SE 600 can use 7- or 13-cm IPG strips. When using two 7-cm IPG strips, side-by-side, up to eight second-dimension separations can be performed at once because the SE 600 Ruby can handle up to four gels (14 [or 16] × 16-cm, up to 1.5-mm thick) simultaneously. The average separation time is 4–5 h.

miniVE Vertical Electrophoresis System offers speed and economy for second-dimension separations. With a 90-min run time and the ability to run two 8 × 9.5-cm gels simultaneously, miniVE enables rapid screening using 7-cm IPG strips (see page 283).

Related products for proteome studies
A wide variety of related products are available for sample preparation, subsequent handling, and analysis of 2-D gels. Sample preparation is simplified by the **Ettan and PlusOne ranges of kits and reagents** (See Chapter 5) designed to provide consistent 2-D results, quickly and reliably. For protein labeling and detection products, blotting membranes, transfer units, and automated gel staining and blot processing using **Processor Plus**, see Chapter 9. For gel and blot imaging and analysis, see Chapter 10.

Tap into 2-D knowledge
In addition to sponsoring seminars, workshops, and conferences around the world on 2-D electrophoresis, a wide variety of 2-D support material is available from GE Healthcare (code numbers listed in parentheses):

Handbooks:
2-D Electrophoresis Using Immobilized pH Gradients, Principles and Methods (80-6429-60) is a comprehensive lab handbook containing information on sample preparation, detailed running conditions for first- and second-dimension systems, troubleshooting, and references.

Application Notes:
Multiple Mini-Format 2-D Electrophoresis Using Precast ExcelGel and Multiphor II Flatbed Electrophoresis System (80-6443-47)
Multiple Mini-Format 2-D Electrophoresis Using SE 600 Standard Vertical Electrophoresis System (80-6445-94)

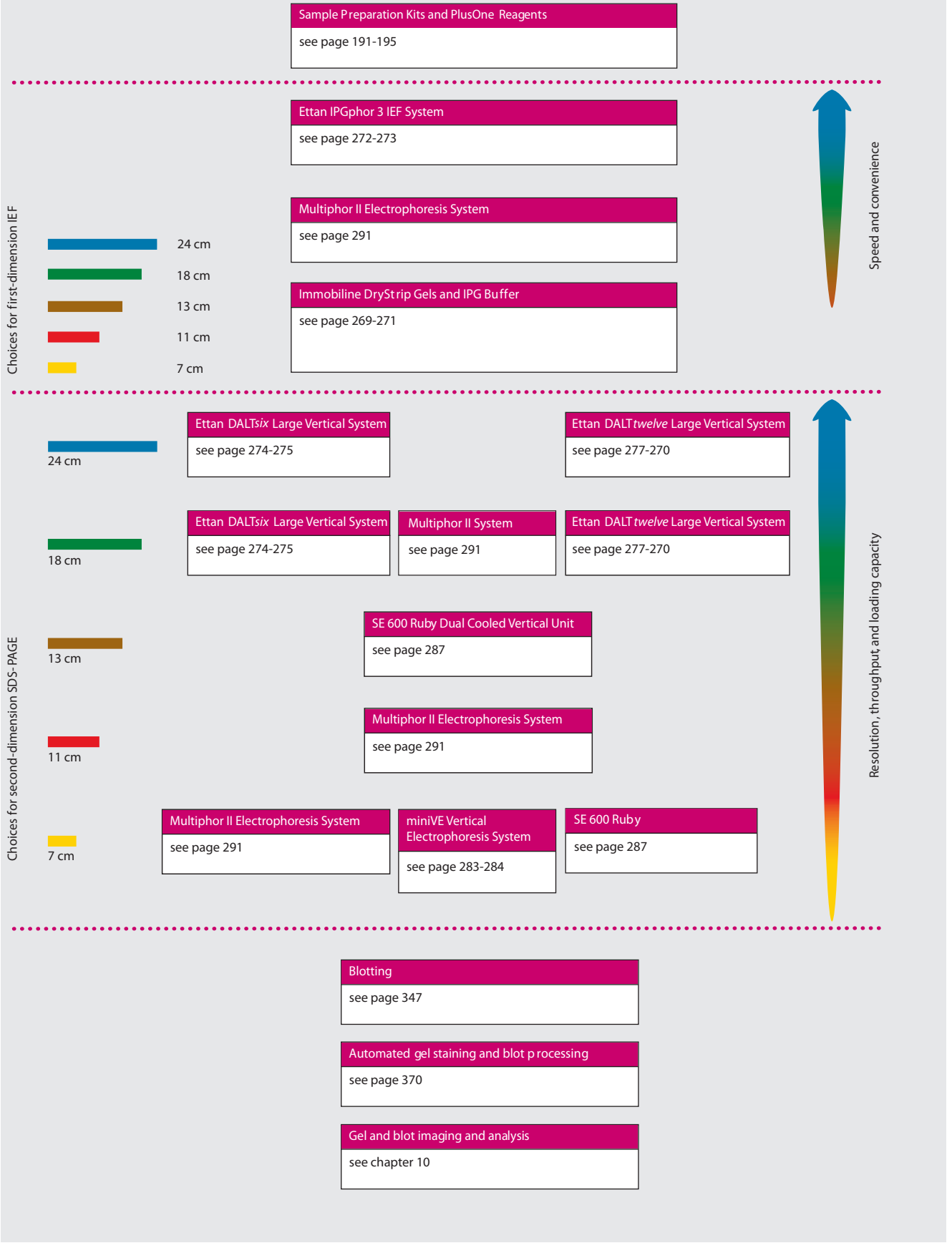
Poster:
2-D Electrophoresis with Narrow-Range Immobiline DryStrip Gels (18-1138-14)

Video:
A Practical Introduction to 2-D Electrophoresis (please inquire).

References

1. Görg, A. *et al. Electrophoresis* **9**, 531–546 (1988).
2. Corbett, J. *et al. Electrophoresis* **15**, 1205–1211 (1994).
3. Blomberg, A. *et al. Electrophoresis* **16**, 1935–1945 (1995).

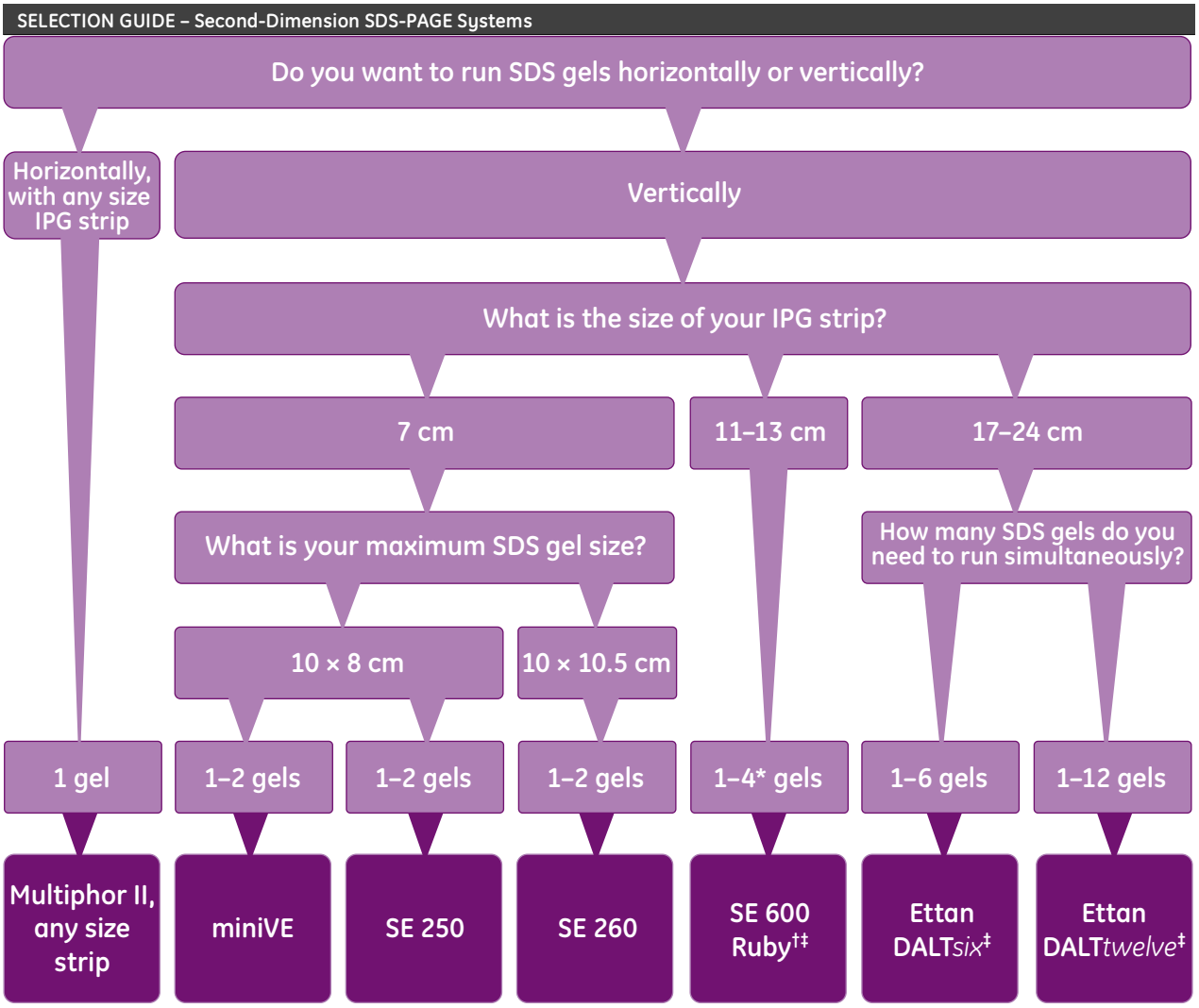
SELECTION GUIDE – 2-D Electrophoresis Tools for Proteome Studies



The choice of a system for performing second-dimension SDS-PAGE depends on several factors. These include:

- Length of IPG strip used in the first-dimension separation.
- Throughput with regards to the number of gels per run and the number of 2-D maps per gel.
- Separation time.

These factors are summarized for each system in the selection guide below.



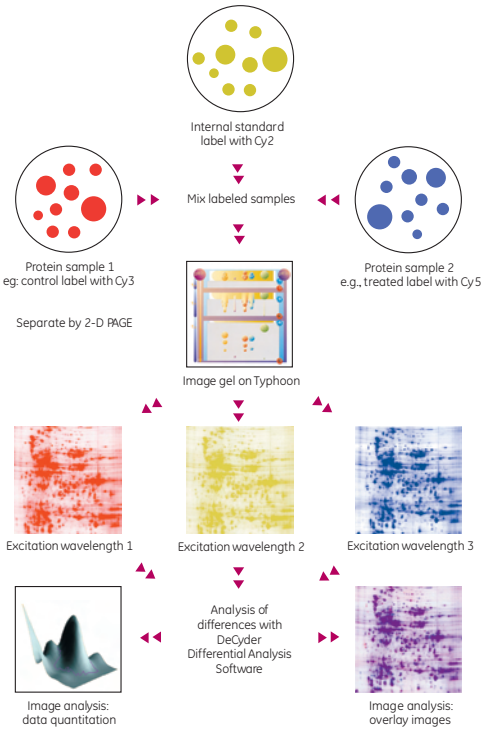
** To use four gels requires accessory divider plate/s*

† When using 13 cm IPG strips, you will need 1 cm spacers

‡ For 2-D DIGE work, use low-fluorescence glass plates

2-D Fluorescence Difference Gel Electrophoresis (2-D DIGE)

Introduction to 2-D Fluorescence Difference Gel Electrophoresis (2-D DIGE) using Ettan DIGE System


Internal standard label with Cy2
Mix labeled samples
Protein sample 1 eg: control label with Cy3
Protein sample 2 e.g., treated label with Cy5
Separate by 2-D PAGE
Image gel on Typhoon
Excitation wavelength 1
Excitation wavelength 2
Excitation wavelength 3
Analysis of differences with DeCyder Differential Analysis Software
Image analysis: data quantitation
Image analysis: overlay images

Workflow for Ettan DIGE system showing co-separation of three fluorescently labeled samples separated on a single 2-D gel. One sample is an internal standard.

- ***Detect an increased number of real differences in protein expression.***
- Identify the smallest possible expression differences.
- Guarantee statistical confidence.
- Eliminate gel-to-gel variation.

Ettan DIGE (2-D Fluorescence Difference Gel Electrophoresis) system enables the prelabeling and separation of up to three samples on a single 2-D gel providing accurate quantitation, reproducibility, ease of use, and increased throughput. Reduced system variability enables accurate study of protein abundance differences against a baseline of inherent biological variation.

The system consists of three main components:

- Protein visualization—CyDye DIGE fluors.
- Image capture—Typhoon Variable Mode Imager or Ettan DIGE Imager.
- Image analysis—DeCyder 2-D Differential Analysis Software or ImageMaster 2D Platinum DIGE Enabled software.

Ettan DIGE system brings statistical confidence and reliability to 2-D electrophoresis. Combining novel proprietary technologies in fluorescence multiplexing and image analysis, Ettan DIGE system is a fully integrated system offering significant benefits over classical 2-D electrophoresis. Ettan DIGE system uses a defined procedure that includes an internal standard to generate the most accurate results. Using the system, up to three protein samples are labeled with novel size- and charge-matched CyDye DIGE fluors and co-separated on the same 2-D electrophoresis gel.

Imaging is performed using the Typhoon Variable Mode Imager or Ettan DIGE Imager. Image analysis is provided by DeCyder 2-D Differential Analysis Software, with or without DeCyder Extended Data Analysis Software module, or with ImageMaster 2D Platinum v6.0 DIGE Enabled software.

Internal standard and experimental design
The major source of error in a 2-D experiment is gel-to-gel variation. To eliminate this, an internal standard is run on all gels within an experiment. Multiplexing using Ettan DIGE system is the only easy way in which an internal standard can be used.

Labeling and internal standardization for real 2-D differences
Using Ettan DIGE system, up to three protein samples labeled with different CyDye DIGE fluors can be run on the same 2-D gel simultaneously. One of these, the internal standard, results from the pooling of aliquots of all biological samples in the experiment. Two sets of dyes are available, the minimal dyes and the saturation dyes from the scarce sample labeling kit. With the minimal dyes, the internal standard is labeled with one CyDye DIGE Fluor minimal dye (e.g., Cy2) and is run together with individual samples labeled with other CyDye DIGE Fluor minimal dyes (e.g., Cy3 and Cy5). With the saturation dyes from the CyDye DIGE Fluor Labeling Kit for Scarce Samples, the internal standard is labeled with one dye (e.g., Cy3) and is run together with individual samples labeled with the Cy5 dye. This means that every protein from all samples will be represented in the internal standard and each protein can therefore be compared to itself within the internal standard to generate a ratio of relative abundance.

The same internal standard is run on all gels within an experimental series thereby creating an intrinsic link across all gels. Normalization of the internal standard across gels allows the ratio of relative abundance of the same protein across gels to be compared directly, separating gel-to-gel variation from biological variation. Even small differences in expression levels can then be determined by comparing the ratio obtained from one fluorescently labeled sample directly with another. As a result, it is possible to see 10% differences in protein abundance between samples, with greater than 95% statistical confidence.

Introduction to 2-D Fluorescence Difference Gel Electrophoresis (2-D DIGE) using Ettan DIGE System (continued)

Experimental design for CyDye DIGE Fluor minimal dyes
An example of a recommended experimental design to derive statistical data on any differences between control and treated samples labeled with CyDye DIGE Fluor minimal dyes Cy2, Cy3, or Cy5 is outlined below. Six control and six treated samples are examined, each sample having its own internal standard according to the table (a pool is created by adding equal amounts of each sample together).

Gel number	Cy2	Cy3	Cy5
1	Pooled standard	Control 1	Treated 3
2	Pooled standard	Control 2	Treated 2
3	Pooled standard	Control 3	Treated 1
4	Pooled standard	Treated 6	Control 4
5	Pooled standard	Treated 5	Control 5
6	Pooled standard	Treated 4	Control 6

Experimental variation is very low with Ettan DIGE system and we therefore recommend biological replicates and not replicates of the same sample. If the same experiment is carried out using conventional 2-D electrophoresis using one sample per gel, at least 12 gels would be required. To gain any meaningful statistical data using this approach would require a minimum of three replicates of each, making 36 gels in total.

Experimental design for CyDye DIGE Fluor saturation dyes from the Scarce Sample Labeling Kit
An example of a recommended experimental design to derive statistical data on any differences between control and treated samples labeled with CyDye DIGE Fluor saturation dyes Cy3 or Cy5 is outlined here. Six control and six treated samples are examined, each sample having its own internal standard.

Gel number	Cy3	Cy5
1	Pooled standard	Control 1
2	Pooled standard	Control 2
3	Pooled standard	Control 3
4	Pooled standard	Control 4
5	Pooled standard	Control 5
6	Pooled standard	Control 6
7	Pooled standard	Treated 1
8	Pooled standard	Treated 2
9	Pooled standard	Treated 3
10	Pooled standard	Treated 4
11	Pooled standard	Treated 5
12	Pooled standard	Treated 6

2-D Fluorescence Difference Gel Electrophoresis (2-D DIGE)

CyDye DIGE Fluors

DIGE approved

- ***Allow detection of up to three prelabeled protein samples and standards on the same 2-D electrophoresis gel.***
- Size- and charge-matched dyes enable co-migration of labeled samples within the gel.
- Bright and highly sensitive dyes allow the use of the minimal labeling technique.
- Minimal loss of signal during labeling, separation, and scanning.
- No change in signal over wide pH range used during first-dimension (IEF) separation.
- Discrete signal from each fluor with minimal cross-talk contributes to high accuracy.

CyDye DIGE fluors are available as minimal and saturation labeling dyes. The minimal dyes are intended for general 2-D application use where sufficient amounts of sample are available. The saturation dyes from the Scarce Sample Labeling Kit are designed to be used for applications where only small amounts of sample are available, for example in Laser Capture Microdissection. In total, three minimal dyes and two saturation dyes are available.

CyDye DIGE fluors are exceptional dyes for multicolor analysis, offering bright and intense colors with narrow excitation and emission bands. The fluors are spectrally distinct, making them ideal for multicolor detection. CyDye DIGE fluors utilize these benefits but are also size- and charge-matched specifically for 2-D DIGE using Ettan DIGE system.

CyDye DIGE Fluor Minimal Dyes

Protein samples and the internal standard are each labeled with one CyDye DIGE Fluor minimal dye. These labeled samples are then combined, run on an isoelectric focusing gel in the first dimension, and separated by SDS-PAGE in the second dimension. Electrophoresis is simplified with Ettan IPGphor 3, or Multiphor II with Immobiline DryStrip gels in the first dimension and Ettan DALT*twelve* or Ettan DALT*six* electrophoresis systems in the second dimension.

The ability to multiplex different CyDye DIGE Fluor minimal dye-labeled samples on the same gel means that the different samples will be subject to exactly the same first- and second-dimension running conditions. Consequently, the same protein labeled with any of the CyDye DIGE Fluor minimal dyes and separated on the same gel will migrate to the same position on the 2-D gel and overlay. This limits experimental variation and ensures accurate within-gel matching.

CyDye DIGE Fluor Labeling Kits for Scarce Samples

Two labeling kits for scarce samples are available: one contains the Cy3 and Cy5 saturation dyes; the other contains those and an additional vial of Cy3 dye to label a preparative gel. Each kit contains sufficient dye for at least 12 labeling reactions and allows labeling of as little as 5 µg protein per labeling reaction. The CyDye DIGE Fluor Labeling Kit for Scarce Samples and Preparative Gel Labeling contains an additional vial of Cy3 dye for labeling up to 500 µg of protein. The saturation dyes Cy3 and Cy5 from the Labeling Kit for Scarce Samples retain the advantages described for the minimal dyes. The saturation dyes in the two kits allow the labeling of 5 µg protein per labeling reaction compared to 50 µg with the minimal dyes. The maleimide reactive group of the saturation dyes covalently bonds to the thiol group of cysteine residues of proteins via a thioether linkage.

ORDERING INFORMATION

Product	Quantity	Code Number
CyDye DIGE Fluor, Cy2 minimal dye	5 nmol	25-8010-82
CyDye DIGE Fluor, Cy3 minimal dye	5 nmol	25-8010-83
CyDye DIGE Fluor, Cy5 minimal dye	5 nmol	25-8010-85
CyDye DIGE Fluor, Cy2 minimal dye	10 nmol	25-8008-60
CyDye DIGE Fluor, Cy3 minimal dye	10 nmol	25-8008-61
CyDye DIGE Fluor, Cy5 minimal dye	10 nmol	25-8008-62
CyDye DIGE Fluor, Cy2 minimal dye	25 nmol	RPK0272
CyDye DIGE Fluor, Cy3 minimal dye	25 nmol	RPK0273
CyDye DIGE Fluor, Cy5 minimal dye	25 nmol	RPK0275
CyDye DIGE Fluor minimal dye labeling kit *NEW*	2 nmol	28-9345-30
DIGE Trial Pack, incl. CyDye DIGE Fluor minimal dye labeling kit (2 nmol) + 1 month free DeCyder 2-D trial license *NEW*	1	28-9373-73
CyDye DIGE Fluor, minimal labeling kit	5 nmol	25-8010-65
CyDye DIGE Fluor Labeling Kit for Scarce Samples	1	25-8009-83
CyDye DIGE Fluor Labeling Kit for Scarce Samples and Preparative Gel Labeling	1	25-8009-84
CyDye DIGE Fluor Preparative Gel Labeling for Scarce Samples, Cy3 saturation dye *NEW*	400 nmol	28-9366-83

For pricing information, visit www.gelifesciences.com/orderonline

Related Products	Code Number	Refer To
Ettan DIGE Imager	63-0056-42	page 383
DeCyder 2-D Differential Analysis Software v6.5		page 265
DeCyder Extended Data Analysis (EDA) Software v1.0		page 266
ImageMaster 2D Platinum v6.0		page 268
Ettan DALT*twelve* Large Vertical System		page 277
Ettan DALT*six* Large Vertical System		page 274
Multiphor II Electrophoresis System		page 291
Ettan IPGphor 3 Isoelectric Focusing Unit	11-0033-64	page 272
Deep Purple Total Protein Stain		page 367

The NHS ester reactive group of CyDye DIGE Fluor minimal dyes covalently attaches to the epsilon amino group of lysine of proteins via an amide linkage. The ratio of dye to protein has been specifically designed to ensure the dyes are limiting in the reaction. As a result, approximately 3% of the available proteins are labeled and then only on a single lysine per protein (i.e., one dye per protein, or minimal labeling).

The amino acid lysine in proteins carries an intrinsic single positive charge at neutral or acidic pH. CyDye DIGE Fluor minimal dyes also carry a single positive charge which, when coupled to the lysine, replaces the single positive charge of the lysine with its own, ensuring that the pI of the protein does not significantly alter compared with the same unlabeled protein.

To achieve maximal labeling of cysteine residues, the protocol uses a high fluor to protein labeling ratio. This type of labeling method labels all available cysteines on each protein under the conditions used, resulting in the majority of cysteine groups in a protein from a sample being labeled. For this reason, the method has been called "saturation labeling."

The CyDye DIGE Fluor saturation dyes covalently label cysteine residues. They have a net neutral charge and therefore do not alter the charge on a protein after labeling. They are also matched for molecular weight ensuring that the same protein from a standard and test sample labeled with the different dyes will overlay when separated on a single gel.

Typhoon

For main product entry, see page 376.

Ettan DIGE Imager

For main product entry, see page 383.

DeCyder 2-D Differential Analysis Software v6.5

DIGE approved

DeCyder 2-D v6.5 startup screen showing analysis workflow.

- ***Dedicated software for 2-D DIGE analysis.***
- Automated analysis, significantly reducing hands-on time.
- Internal standard approach, increasing accuracy and simplifying gel-to-gel matching.
- No spot matching within gels, eliminating matching errors.
- Automatic Oracle client and server installation, offering easy project handling and data security.
- Optional DeCyder Extended Data Analysis (EDA), a multivariate statistics module for easier and faster biomarker discovery.

DeCyder 2-D Differential Analysis Software (DeCyder 2-D) v6.5 has been specifically developed for 2-D Fluorescence Difference Gel Electrophoresis (2-D DIGE). This software significantly increases throughput by accurately addressing measurement of protein differences with statistical confidence and reduces hands-on time from days to minutes with minimal user-to-user variation. The software automatically detects, matches, and analyzes protein spots in multiplexed fluorescent images, and is able to detect small differences between protein spots with high statistical confidence.

DeCyder 2-D v6.5 consists of several modules:

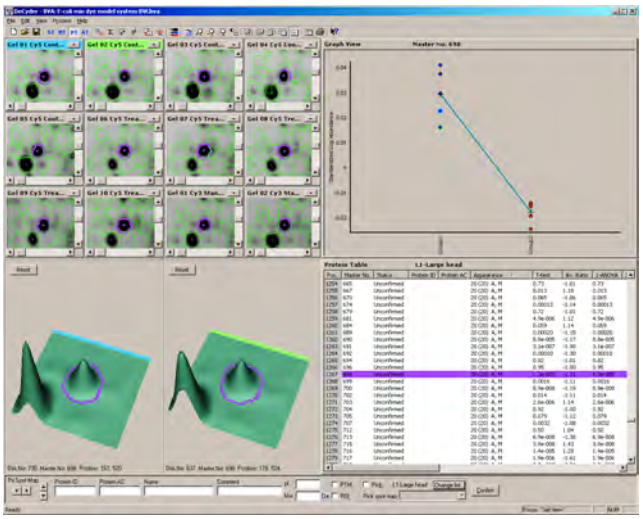
- Differential In-gel Analysis (DIA)—co-detection, background subtraction, normalization, and quantitation of spots in images from a single 2-D DIGE gel.
- Biological Variation Analysis (BVA)—matching multiple 2-D DIGE gels for comparison and statistical analysis of protein abundance changes.
- Extended Data Analysis (EDA)—providing advanced statistical analysis for characterization and classification of biological samples based on protein expression data.
- Batch Processor—automated detection, quantitation, matching, and comparison of multiple 2-D DIGE gels.
- Image Loader—importing images into an Oracle database.
- Administration Tools—database administration, maintenance, and user access control.
- XML Toolbox—exporting spot data from DIA or BVA modules for further downstream analysis.

ORDERING INFORMATION

Product	Quantity	Code Number
DeCyder 2-D Differential Analysis Software v6.5, preinstalled network (including PC and single concurrent network user license)	1	28-4012-01
DeCyder 2-D Differential Analysis Software v6.5, one network user license	1	11-0035-82
DeCyder 2-D Differential Analysis Software v6.5, four additional network user licenses	1	11-0035-81
Other packages available on request		

For pricing information, visit www.gelifesciences.com/orderonline

Related Products	Code Number	Refer To
Typhoon Variable Mode Imager		page 376
Typhoon Trio	63-0055-87	page 376
DeCyder Extended Data Analysis (EDA) Software v1.0		page 266
Ettan DIGE Imager, including installation kit	63-0056-42	page 383
Ettan IPGphor 3 Isoelectric Focusing Unit	11-0033-64	page 383
ImageMaster 2D Platinum v6.0		page 268
CyDye DIGE Fluors		page 264



BVA user interface is used to detect and statistically quantitate differences between samples.

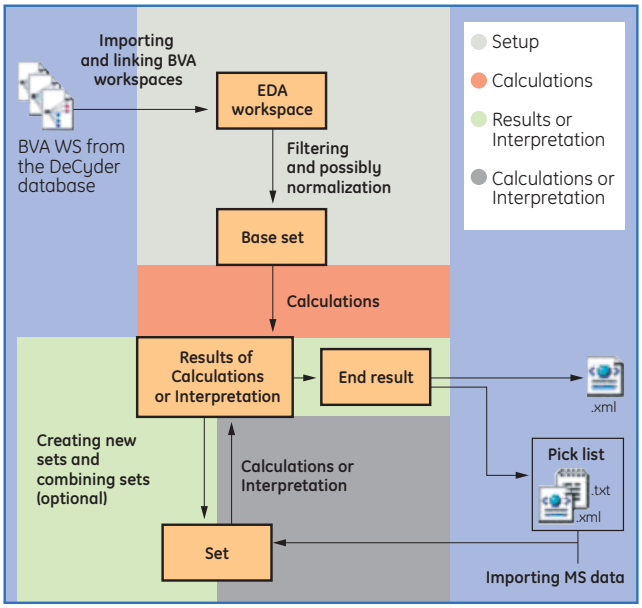
References

1. Alban, A. *et al.* A novel experimental design for comparative two-dimensional gel analysis: two-dimensional difference gel electrophoresis incorporating a pooled internal standard. *Proteomics* **3**, 36–44 (2003).
2. Yan, J. X. *et al.* Fluorescence 2-D Difference Gel Electrophoresis and mass spectrometry based proteomic analysis of *Escherichia coli*. *Proteomics* **2**, 1682–1698 (2002).
3. Unlu, M. *et al.* Difference gel electrophoresis: a single method for detecting changes in protein extracts. *Electrophoresis* **18**, 2071–2077 (1997).
4. Tonge, R. P. *et al.* Validation and development of fluorescence two-dimensional difference gel electrophoresis proteomics technology. *Proteomics* **1**, 377–396 (2001).

2-D Fluorescence Difference Gel Electrophoresis (2-D DIGE)

DeCyder Extended Data Analysis (EDA) Software v1.0

DIGE approved



Analysis workflow in DeCyder EDA.

- ***Offers advanced statistical analysis of proteomics data sets in a simple-to-use format.***
- Employs multivariate analysis and sophisticated clustering methods to uncover patterns and relationships in expression data.
- Identifies proteins that discriminate between disease stages, tumor types, or other sample subtypes.
- Integrates data from multiple Biological Variation Analysis (BVA) workspaces.
- Helps you understand regulatory pathways.
- Integrates data from external databases.

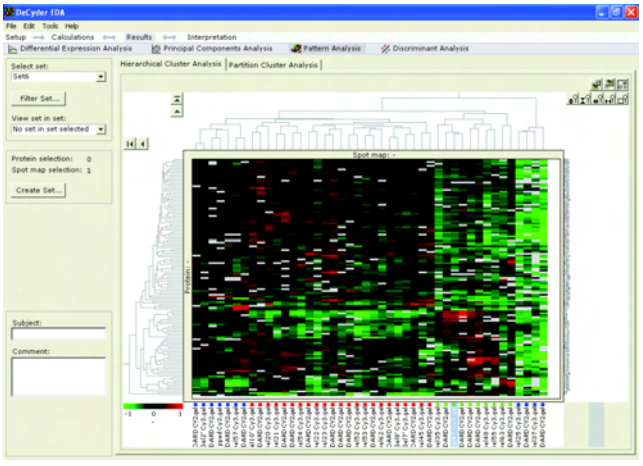
DeCyder Extended Data Analysis Software (DeCyder EDA) is high-performance informatics software for the analysis of large and combined proteomics data sets. DeCyder EDA was developed specifically for 2-D DIGE methodology and extends the statistical options offered in DeCyder 2-D Differential Analysis Software (DeCyder 2-D). This software enables the seamless integration of DeCyder EDA statistical results with DeCyder 2-D visualization data, thereby placing the results into biological context by linking to internal and external databases.

ORDERING INFORMATION

Product	Quantity	Code Number
DeCyder Extended Data Analysis Software, one network user license	1	28-4012-03
DeCyder Extended Data Analysis Software, one additional network user license	1	28-4027-11
DeCyder Extended Data Analysis Software, four additional network user licenses	1	28-4012-05
DeCyder Extended Data Analysis Software, 1-month trial license	1	28-4017-86
DeCyder Extended Data Analysis Software, 6-month trial license	1	28-4020-87

For pricing information, visit www.gelifesciences.com/orderonline

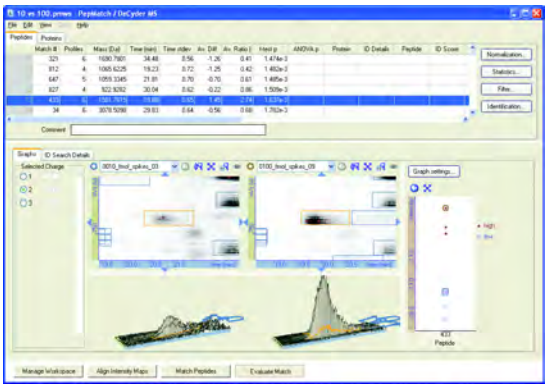
Related Products	Code Number	Refer To
DeCyder 2-D Differential Analysis Software v6.5		page 265



Results from Pattern Analysis calculations, with Hierarchical Cluster Analysis tab shown.

DeCyder MS Differential Analysis Software

Example of analysis results using the PepDetect module.



Example of results from the PepMatch module.

- ***Provides a completely new level of software support to MS-based differential analysis without the need for any mass tag chemistry.***
- Reduces hands-on time and minimizes user-to-user variation by automatic detection, matching, and analysis of peptides from multiple LC-MS raw data files.
- Automatically presents quantitative information and matching statistics from complex experiments such as time-dose series.
- Visualizes LC-MS data in a novel way to enable effective navigation and presentation of large data sets.

DeCyder MS Differential Analysis Software significantly increases analysis efficiency by automating measurements of peptides from large data sets with statistical confidence.

This proprietary software, based on DeCyder 2-D Differential Analysis Software, automatically detects, matches, and analyzes peptides from multiple LC-MS experiments and is able to detect small differences between peptides with high statistical confidence. Statistical analysis is carried out on all peptide peaks within minutes.

ORDERING INFORMATION

Product	Quantity	Code Number
DeCyder MS 2.0	1	28-9078-84
(including ONE additional concurrent networked e-license)		
DeCyder MS 2.0	1	28-9083-59
(demo license - no user manual & low cost packaging - including 8-week single node locked e-license to be used for demo purposes only)		
DeCyder MS 2.0	1	28-9083-60
(single user concurrent networked e-license)		
DeCyder MS 2.0	1	28-9083-61
(single user concurrent networked e-license and including PC**)		
DeCyder MS 2.0	1	28-9083-62
(FIVE additional concurrent networked e-licenses)		
DeCyder MS 2.0	1	28-9083-64
(TEN additional concurrent networked e-licenses)		
DeCyder MS 2.0	1	28-9086-31
(upgrade from 1.0 - ONE concurrent networked e-license)		

For pricing information, visit www.gelifesciences.com/orderonline

DeCyder MS Differential Analysis Software consists of two analysis features: Peptide Detection with the PepDetect module and Run-to-Run Matching with the PepMatch module.

PepDetect module

The detection module provides consistent and accurate peptide detection, background subtraction, isotope and charge-state deconvolution, as well as peak volume calculations using novel imaging algorithms. The software's visualization tools offer the user new capabilities to optimize chromatography and MS/MS settings.

In addition, where MS/MS data is available the module provides the researcher with an option of submitting all or a selected subset of peptides for protein identification. The Batch Processor enables the PepDetect module to process several hundred LC-MS raw data files without user interaction.

PepMatch module

Peptides from different runs are aligned using this module. PepMatch detects small quantitative differences between peptides across multiple runs with high statistical confidence. Various normalization techniques can be applied to further improve results.

The module supports a wide range of experimental designs, such as control/treated experiments as well as time-dose studies. In addition, when MS/MS data is available, deviating peptides can be submitted for protein identification and once identification information is available, this can also be used to look at co-variation of peptides from the same protein.

Automated Statistical Analysis

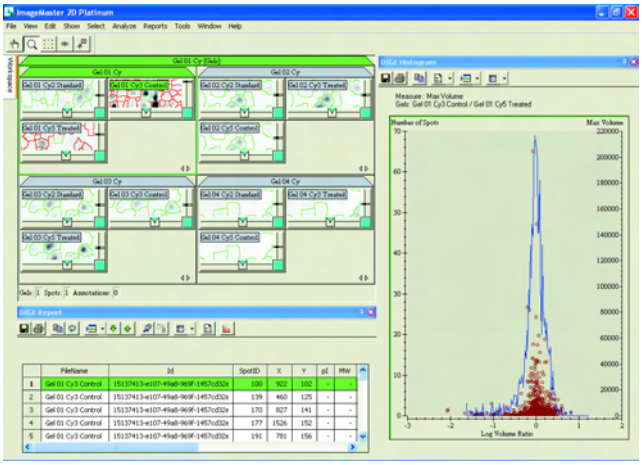
DeCyder MS Differential Analysis Software enables internal standardization of protein abundance differences. The software features fully automated statistical analysis and a list of statistically significant differences is generated automatically.

2-D Fluorescence Difference Gel Electrophoresis (2-D DIGE)

DIGE approved

ImageMaster 2D Platinum v6.0

- ***New DIGE-enabled version uses the DeCyder 2-D co-detection algorithm and supports the internal standard approach.***
- Workspace feature combines all gel, matching, and analysis data, and controls all operations.
- No arbitrary reference gel is necessary. Compares gel populations directly, thus adding significance to your analysis results.
- Updated display features such as multiple interlinked images, tables, and graphs allow you to interact with your results, easily access all analytical data, and work with a virtually unlimited number of gels.
- Dockable report windows let you customize the application layout according to your personal preferences.
- E-licensing allows easy access to the software with added security.



ImageMaster 2D Platinum v6.0 user interface with dockable windows simplifies the process of 2-D gel image analysis. DIGE-enabled version shown.

ImageMaster 2D Platinum v6.0 combines the superior spot detection and reliable matching of ImageMaster 2D Platinum v5.0 with the unique spot co-detection of DeCyder 2-D Differential Analysis Software v6.5. Version 6.0 offers one common interface for both DIGE and non-DIGE gels.

ImageMaster 2D Platinum v6.0 was developed by the Swiss Institute of Bioinformatics in collaboration with GeneBio and GE Healthcare. It is powered by the innovative and widely used Melanie gel analysis software. The flexible and intuitive nature of ImageMaster 2D Platinum v6.0 allows users to perform analyses specific to their individual requirements.

ORDERING INFORMATION		
Product	**Quantity**	**Code Number**
Image Master 2D Platinum 7.0, 1 license *NEW*	1	**28-9380-91**
Image Master 2D Platinum 7.0 DIGE , 1 license *NEW*	1	**28-9380-55**
Image Master 2D Platinum 7.0 upgrade to DIGE , 1 license *NEW*	1	**28-9398-10**
Image Master 2D Platinum 6.0 upgrade to 7.0, 1 license *NEW*	1	**28-9399-70**
Image Master 2D Platinum 6.0 DIGE†upgrade to 7.0 DIGE, 1 license *NEW*	1	**28-9380-80**

For pricing information, visit www.gelifesciences.com/orderonline

Other packages available. Please contact your sales representative.
Note: An e-license is required for access to ImageMaster 2D Platinum v7.0.

Related Products	Code Number	Refer To
ImageScanner III	28-9076-07	page 387
Ettan IPGphor 3 Isoelectric Focusing Unit	11-0033-64	page 272
Ettan DIGE Imager	63-0056-42	page 383
Typhoon 9210	63-0055-76	page 376
Ettan Spot Picker	18-1145-28	page 279

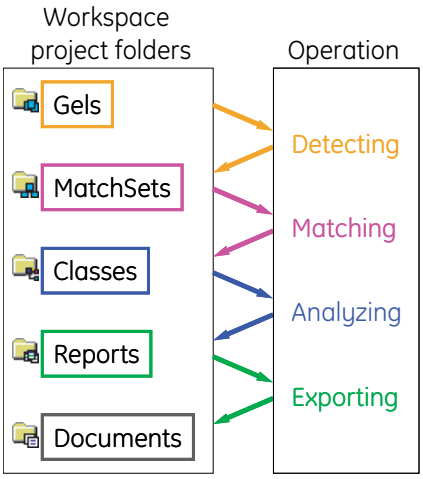


Image analysis from start to finish in the workspace.

DIGE approved

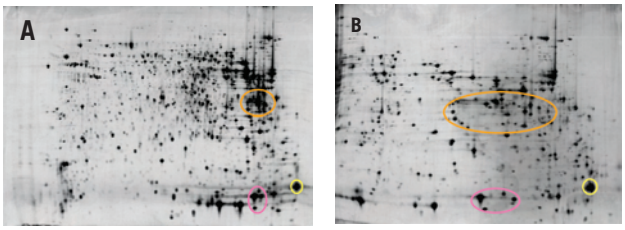
Immobiline DryStrip Gels

- ***Maximize resolution, loading capacity, and reproducibility of first-dimension IEF.***
- Choose from a comprehensive range of overlapping Immobiline DryStrip gels that cover narrow (1 pH unit), medium (3–5 pH units), and broad (8 pH units) pH ranges.
- Select the broad pH 3–11 NL gradient Immobiline DryStrip gel for fast and efficient screening to gain a broad overview of total protein disribution.
- For more detailed studies or when using greater protein loads, choose from four new overlapping strips covering the pH 3 to 11 range.
- Higher resolution can be obtained using narrow–range (1 pH unit) Immobiline DryStrip gels.
- Use matching IPG Buffers for optimized running conditions.
- Use IPG strips directly after reswelling without further manipulation.
- Barcoded strips for convenient sample and batch tracking.

Immobiline DryStrip gels are available in fourteen overlapping pH ranges and five strip lengths (7, 11, 13, 18, and 24 cm) and represent the most comprehensive selection of narrow-, medium-, and wide-range IPG strips available (see Ordering Information). The five narrow pH range (1 pH unit), 24-cm IPG strips deliver the highest resolution and protein loading capacity available, which results in well separated spots with high protein content after the second-dimension separation.

The pH 3–11 NL strip covers most proteins found in prokaryotic and eukaryotic cells while the narrow-range strips can be used when higher resolution is required. The pH gradients at the extreme ends of the pH scale are nonlinear to distribute the proteins evenly over the gel length to obtain maximal resolution.

Immobiline DryStrip gels are rehydrated with a matching IPG Buffer prior to use. Samples can be included directly in the rehydration solution for efficient loading of dilute samples or for loading larger amounts of protein. Samples can also be loaded after rehydration. The first-dimension separation is carried out using Ettan IPGphor 3 IEF system or Multiphor II flatbed system.



Immobiline DryStrip gels were rehydrated in DeStreak Rehydration Solution with IPG Buffer solution as indicated. Second dimension: Ettan DALTtwelve using DALT Gel 12.5 precast SDS-PAGE gels. Staining: PlusOne Silver Staining Kit, Protein. Rings or ovals of the same color present on the broad pH gradient 3–11 NL and the medium-range 7–11 NL indicate the same protein groups. Yellow ring = alkylated lysozyme, alkylated lysozyme pI = 10.5 (calculated according to SwissProt).
A. Broad-range Immobiline DryStrip pH 3–11 NL, 24 cm using 0.5% Buffer 3–11 NL, run for 42 kVh. Sample: 100 µg mouse liver extract + 7.5 µg alkylated lysozyme, cup application at the anode.
B. Medium-range Immobiline DryStrip pH 7–11 NL, 24 cm using 0.5% IPG Buffer 7–11 NL, run for kVh. Sample: 100 µg of mouse liver extract + 5 µg alkylated lysozyme, cup application at the anode.

ORDERING INFORMATION

Product	Quantity	Code Number
Immobiline DryStrip gels, 24 cm		
Immobiline DryStrip pH 3-5.6 NL, 24 cm	12	17-6003-57
Immobiline DryStrip pH 5.3-6.5, 24 cm	12	17-6003-62
Immobiline DryStrip pH 6.2-7.5, 24 cm	12	17-6003-67
Immobiline DryStrip pH 7-11 NL, 24 cm	12	17-6003-72
Immobiline DryStrip pH 3-11 NL, 24 cm	12	17-6003-77
Immobiline DryStrip pH 3.5-4.5, 24 cm	12	17-6002-38
Immobiline DryStrip pH 4.0-5.0, 24 cm	12	17-6002-39
Immobiline DryStrip pH 4.5-5.5, 24 cm	12	17-6002-40
Immobiline DryStrip pH 5.0-6.0, 24 cm	12	17-6002-41
Immobiline DryStrip pH 5.5-6.7, 24 cm	12	17-6002-42
Immobiline DryStrip pH 3-7 NL, 24 cm	12	17-6002-43
Immobiline DryStrip pH 4-7, 24 cm	12	17-6002-46
Immobiline DryStrip pH 6-9, 24 cm	12	17-6002-47
Immobiline DryStrip pH 3-10 NL, 24 cm*	12	17-6002-45
Immobiline DryStrip pH 3-10, 24 cm	12	17-6002-44
Immobiline DryStrip gels, 18 cm		
Immobiline DryStrip pH 3-5.6 NL, 18 cm	12	17-6003-56
Immobiline DryStrip pH 5.3-6.5, 18 cm	12	17-6003-61
Immobiline DryStrip pH 6.2-7.5, 18 cm	12	17-6003-66
Immobiline DryStrip pH 7-11 NL, 18 cm	12	17-6003-71
Immobiline DryStrip pH 3-11 NL, 18 cm	12	17-6003-76
Immobiline DryStrip pH 3.5-4.5, 18 cm	12	17-6001-83
Immobiline DryStrip pH 4.0-5.0, 18 cm	12	17-6001-84
Immobiline DryStrip pH 4.5-5.5, 18 cm	12	17-6001-85
Immobiline DryStrip pH 5.0-6.0, 18 cm	12	17-6001-86
Immobiline DryStrip pH 5.5-6.7, 18 cm	12	17-6001-87
Immobiline DryStrip pH 4-7, 18 cm	12	17-1233-01
Immobiline DryStrip pH 6-9, 18 cm	12	17-6001-88
Immobiline DryStrip pH 6-11, 18 cm	12	17-6001-97
Immobiline DryStrip pH 3-10 NL, 18 cm*	12	17-1235-01
Immobiline DryStrip pH 3-10, 18 cm	12	17-1234-01
Immobiline DryStrip gels, 13 cm		
Immobiline DryStrip pH 3-5.6 NL, 13 cm	12	17-6003-55
Immobiline DryStrip pH 5.3-6.5, 13 cm	12	17-6003-60
Immobiline DryStrip pH 6.2-7.5, 13 cm	12	17-6003-65
Immobiline DryStrip pH 7-11 NL, 13 cm	12	17-6003-70
Immobiline DryStrip pH 3-11 NL, 13 cm	12	17-6003-75
Immobiline DryStrip pH 4-7, 13 cm	12	17-6001-13
Immobiline DryStrip pH 6-11, 13 cm	12	17-6001-96
Immobiline DryStrip pH 3-10 NL, 13 cm*	12	17-6001-15
Immobiline DryStrip pH 3-10, 13 cm	12	17-6001-14
Immobiline DryStrip gels, 11 cm		
Immobiline DryStrip pH 3-5.6 NL, 11 cm	12	17-6003-54
Immobiline DryStrip pH 5.3-6.5, 11 cm	12	17-6003-59
Immobiline DryStrip pH 6.2-7.5, 11 cm	12	17-6003-64
Immobiline DryStrip pH 7-11 NL, 11 cm	12	17-6003-69
Immobiline DryStrip pH 3-11 NL, 11 cm	12	17-6003-74
Immobiline DryStrip pH 4-7, 11 cm	12	18-1016-60
Immobiline DryStrip, pH 6-11, 11 cm	12	17-6001-95
Immobiline DryStrip pH 3-10, 11 cm	12	18-1016-61
Immobiline DryStrip gels, 7 cm		
Immobiline DryStrip pH 3-5.6 NL, 7 cm	12	17-6003-53
Immobiline DryStrip pH 5.3-6.5, 7 cm	12	17-6003-58
Immobiline DryStrip pH 6.2-7.5, 7 cm	12	17-6003-63
Immobiline DryStrip pH 7-11 NL, 7 cm	12	17-6003-68
Immobiline DryStrip pH 3-11 NL, 7 cm	12	17-6003-73
Immobiline DryStrip pH 4-7, 7 cm	12	17-6001-10
Immobiline DryStrip, pH 6-11, 7 cm	12	17-6001-94
Immobiline DryStrip pH 3-10 NL, 7 cm*	12	17-6001-12
Immobiline DryStrip pH 3-10, 7 cm	12	17-6001-11

For pricing information, visit www.gelifesciences.com/orderonline

** Increased resolution between pH 5 and pH 7.*

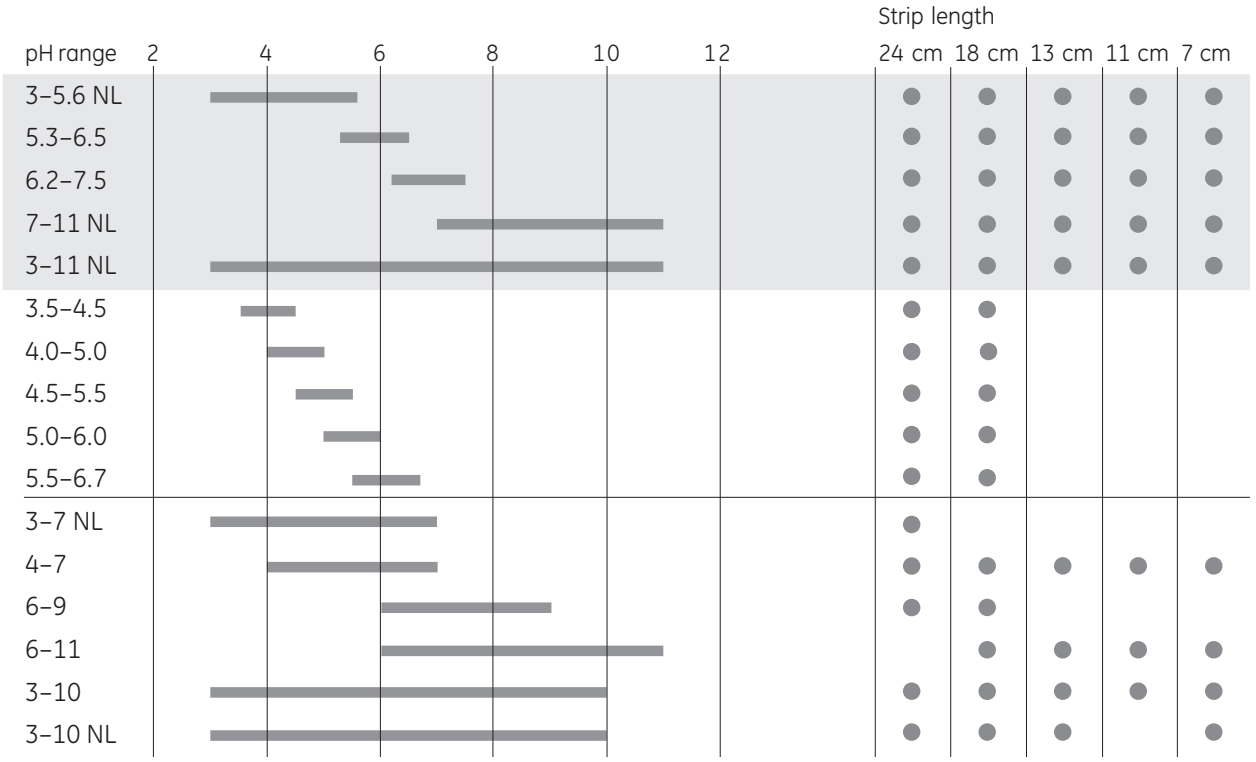
First Dimension

Immobiline DryStrip Gels (continued)

TECHNICAL SPECIFICATIONS	
Gel dimensions	70 × 3 × 0.5 mm, 110 × 3 × 0.5 mm, 130 × 3 × 0.5 mm, 180 × 3 × 0.5 mm, 240 × 3 × 0.5 mm
Gel matrix	Polyacrylamide T = 4%, C = 3%
Gel backing	Polyester film
Storage	-20°C

Related Products	Code Number	Refer To
Ettan IPGphor 3 Isoelectric Focusing Unit	11-0033-64	page 272
Multiphor II	18-1018-06	page 291
Immobiline DryStrip Kit	18-1004-30	page 292
IPG Buffers		page 271
IPGbox *NEW*	28-9334-65	page 271
IPGbox Kit *NEW*	28-9334-92	page 271
Introduction to Trap Kits for Protein Sample Preparation		page 190
DeStreak Rehydration Solution	17-6003-19	page 307
DeStreak Reagent	17-6003-18	page 307

SELECTION GUIDE – Immobiline DryStrip Gels



Guidelines for choosing Immobiline DryStrip gels

- Use shorter strips for fast screening or when only the most abundant proteins are of interest.
- Use longer strips for maximal resolution and loading capacity.
- To overview total protein distribution, use pH 3–11 NL strips.
- For increased resolution between pH 5–7, use a nonlinear gradient pH 3–10 strip to distribute the proteins more evenly over the strip.
- Combine pH 3–7 NL and pH 6–11, pH 3–7 NL and pH 6–9, or select from 3–5.6 NL, 5.3–6.5, 6.2–7.5, and 7–11 NL when more detail is required.
- Use narrow pH range strips (1 pH unit) to closely study proteins in the regions of interest.

DIGE approved

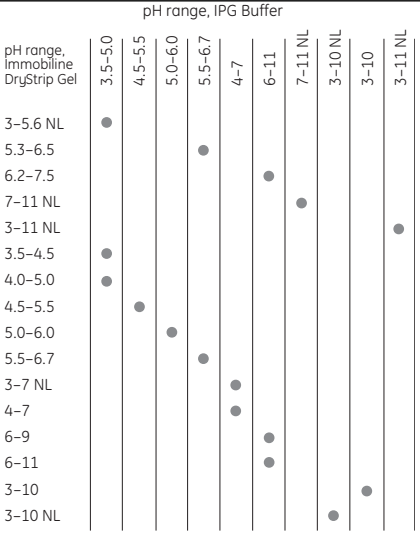
IPG Buffers

- ***For use with Immobiline DryStrip gels to improve protein solubility.***
- Ensures optimal conditions for IEF separation.
- Eliminates background staining.

IPG Buffers are ampholyte-containing buffer concentrates specifically formulated for use with Immobiline DryStrip gels. Each IPG Buffer type produces more uniform conductivity along the Immobiline DryStrip during focusing, resulting in wider latitude in run times. IPG Buffers also eliminate high background staining.

IPG Buffers are supplied in 1-ml aliquots of water. The buffer is diluted 50- or 200-fold in the rehydration solution, depending on the first-dimension system and pH range of the strip.

SELECTION GUIDE – pH Ranges of Immobiline DryStrip Gels and Recommended IPG Buffers



ORDERING INFORMATION

Product	Quantity	Code Number
IPG Buffer pH 3.5-5.0	1 ml	17-6002-02
IPG Buffer pH 4.5-5.5	1 ml	17-6002-04
IPG Buffer pH 5.0-6.0	1 ml	17-6002-05
IPG Buffer pH 5.5-6.7	1 ml	17-6002-06
IPG Buffer pH 4-7	1 ml	17-6000-86
IPG Buffer pH 6-11	1 ml	17-6001-78
IPG Buffer pH 7-11 NL	1 ml	17-6004-39
IPG Buffer pH 3-10 NL	1 ml	17-6000-88
IPG Buffer pH 3-10	1 ml	17-6000-87
IPG Buffer pH 3-11 NL	1 ml	17-6004-40

For pricing information, visit www.gelifesciences.com/orderonline

Related Products	Refer To
Immobiline DryStrip Gels	page 269
DeStreak Rehydration Solution	page 307
DeStreak Reagent	page 307

IPGbox and IPGbox Kit *NEW*

DIGE approved

IPGbox is designed for simultaneous rehydration of up to 12 Immobiline DryStrip gels.

- ***Rehydrate up to 12 Immobiline DryStrip gels or other IPG strips independently and at the same time.***
- Lid protects the IPG strips from dust and contamination.
- Oil-free rehydration.
- Load samples for IEF during rehydration by including them in the rehydration buffer; alternatively, load sample using sample cups.

ORDERING INFORMATION

Product	Quantity	Code Number
IPGbox *NEW* *Includes: 1 IPGbox and 1 IPGbox Kit*	1	28-9334-65
IPGbox Kit *NEW* *Includes: 10 Reswell Trays and 1 IPGbox Insert*	1	28-9334-92

For pricing information, visit www.gelifesciences.com/orderonline

Related Products	Refer To
Immobiline DryStrip Gels	page 269
Ettan IPGphor 3 IEF System	page 272

IPGbox is used together with the IPGbox Kit to rehydrate 7 to 24 cm Immobiline DryStrip gels. The IPGbox Kit contains 10 disposable Reswell Trays and one disposable IPGbox Insert. The IPGbox comes with the complete set of accessories to rehydrate 10 full rounds of 12 IPG strips each.

First Dimension

Ettan IPGphor 3 IEF System

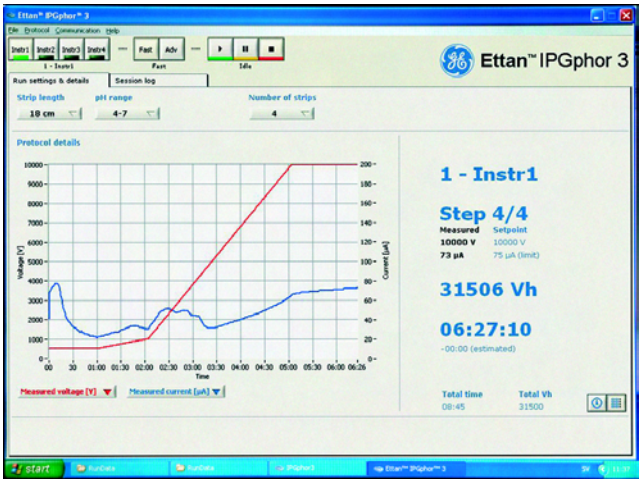
Supported by Labcrew

DIGE approved

Ettan IPGphor 3 IEF System is easy to use, capable of generating fast, reproducible runs, and is designed to work as stand alone or in conjunction with PC control.

- ***Ettan IPGphor 3 IEF System is a fully integrated isoelectric focusing system optimized to deliver speed and reliability in the first dimension of 2-D electrophoresis.***
- Run up to 12 IPG strips (7, 11, 13, 18, or 24 cm) simultaneously using Ettan IPGphor Manifold, Ettan IPGphor Manifold Light, or ceramic strip holders.
- Use sample cups with Ettan IPGphor Manifold or Ettan IPGphor Manifold Light to significantly increase protein loads.
- Ettan IPGphor 3 Control Software allows management of up to four Ettan IPGphor 3 IEF units simultaneously, each running a different set of run parameters.
- Lid design allows optimum running with light-sensitive protein samples.
- The system is fully compatible with the earlier Ettan IPGphor IEF unit and is ideal for 2-D DIGE applications.

The improved, easy-to-use Ettan IPGphor 3 system overcomes the most common hurdles of existing technology, to consistently deliver speed, reproducibility, and handle increased protein loads. Ettan IPGphor 3 unit has undergone a complete redesign to provide an even higher level of quality and reproducibility with improved sample handling and PC control.



Graphical display of voltage, current, and volt-hours.

ORDERING INFORMATION

Product	Quantity	Code Number
Ettan IPGphor 3 Isoelectric Focusing Unit	1	11-0033-64
Basic unit includes cable, Ettan IPGphor 3 Control Software, and Ettan IPGphor 3 Tutorial CD		
Cable Serial 9 Pin F/F with Null Modem Adapter	1	80-6506-36
Ettan IPGphor 3 Control Software	1	11-0036-23
USB to RS232 Adapter	1	28-4001-45
Ettan IPGphor Manifold		
Ettan IPGphor Manifold, Complete	1	80-6498-38
IPGphor Manifold ceramic tray	1	80-6498-57
Sample cups	120	80-6498-95
Paper electrode	240	80-6499-14
Paper bridge pads	120	80-6499-33
Electrode set	1	80-6498-76
Lid adaptor for IPGphor 3	1	28-4008-41
Cleaning brush	1	80-6505-98
Spirit level	1	80-6194-19
Forceps SS	1	80-6506-17
Ettan IPGphor Manifold Light		
Ettan IPGphor Manifold Light Complete	1	11-0026-88
Ettan IPGphor Manifold Polymeric Tray	1	11-0025-80
Strip holders		
24 cm Strip Holder, Complete	6	80-6469-88
18 cm Strip Holder, Complete	6	80-6416-68
13 cm Strip Holder, Complete	6	80-6416-49
11 cm Strip Holder, Complete	6	80-6416-30
7 cm Strip Holder, Complete	6	80-6416-11
24 cm Strip Holder, Complete	1	80-6470-07
18 cm Strip Holder, Complete	1	80-6417-44
13 cm Strip Holder, Complete	1	80-6417-25
11 cm Strip Holder, Complete	1	80-6417-06
Sample Cup, Cup Loading Strip Holder	50	80-6459-81
Cleaning Solution, Strip Holder	950 ml	80-6452-78
Strip holder covers		
Strip Holder Cover, 7 cm	2	80-6455-44
Strip Holder Cover, 11 cm	2	80-6455-63
Strip Holder Cover, 13 cm	2	80-6455-82
Strip Holder Cover, 18 cm	2	80-6456-01
Strip Holder Cover, 24 cm	2	80-6479-76
Accessory		
Equilibration Tube Set	12	80-6467-79

For pricing information, visit www.gelifesciences.com/orderonline

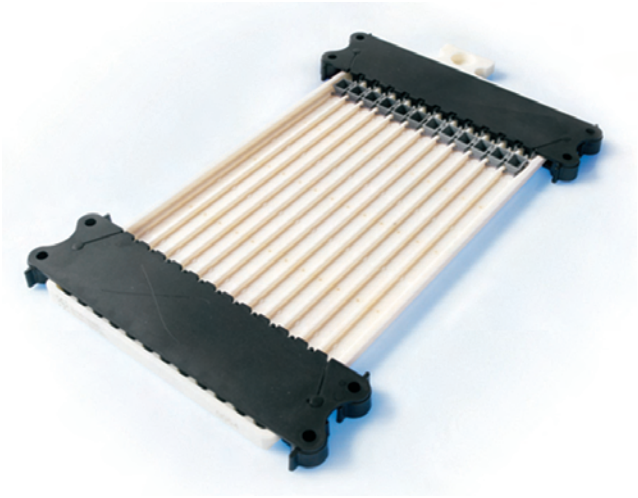
Related Products	Code Number	Refer To
Immobiline DryStrip Gels		page 269
CyDye DIGE Fluors		page 264
Introduction to Trap Kits for Protein Sample Preparation		page 190
DeStreak Rehydration Solution	17-6003-19	page 307
DeStreak Reagent	17-6003-18	page 307

Ettan IPGphor 3 Control Software enables creation, storage, and editing of protocols. Recommended run parameters are suggested by merely entering data relating to the number and type of Immobiline DryStrips being used.

Ettan IPGphor 3 IEF System (continued)

Ettan IPGphor 3 Control Software

Ettan IPGphor 3 Control Software generates professional graphical reports with a large user interface for programming and editing. The user can create, save, and edit protocols and also pause during a run to edit a protocol in real time. The software can be used to control up to four Ettan IPGphor 3 IEF units simultaneously, each running a different set of run parameters. The units can be started, stopped, or paused using the PC control unit. The software enables web browser remote monitoring of the PC control unit. Stored log files of previous runs can be opened and viewed and status reports can be generated along with instantaneous run condition reports on request. Log files can be exported, for example to Microsoft Excel. The software monitors voltage, current, and volt-hours of the run and generates a graphical display as the run proceeds. Reports can be created, saved, printed, and exported.



Ettan IPGphor Manifold is a cup-loading accessory for Ettan IPGphor IEF unit allowing electrophoresis of large sample loads on IPG strip lengths from 7–24 cm.

Ettan IPGphor Manifolds

Ettan IPGphor Manifolds are high-throughput accessories for first-dimension isoelectric focusing of proteins using IPG strips. These manifolds meet the increasingly stringent demands of proteomics research by ensuring high-resolution, micropreparative protein analysis.

Ettan IPGphor Manifold and Manifold Light simplify isoelectric focusing of multiple samples and reduce first-dimension hands-on time to a minimum. They significantly speed up the processing of micropreparative loads in first-dimension analysis.

TECHNICAL SPECIFICATIONS

Ettan IPGphor 3 Isoelectric Focusing Unit	
Operating temperature	15°C to 35°C
Relative humidity	0% to 70%
Line voltage	115/230 V
Frequency	50/60 Hz
Power consumption	100 W
Voltage	0–10000 V, resolution: 10 V
Current	0–1.5 mA, resolution: 1 µA
Power	Max. 12 W
Material	Aluminum oxide ceramic base, acrylic cover, polycarbonate, platinum on titanium
Electrode areas	Gold-plated copper
Strip holders	
Strip holders	For IPG strip lengths: 7, 11, 13, 18, and 24 cm
Strip Holder capacity	Up to 12 fixed-length, on one manifold tray
Cup-loading manifold	For all strip lengths, cup and paper-bridge loading
User interface	
Control panel	Seven-key membrane keypad
Programmable parameters	Rehydration time, platform temperature, maximum current limit per strip, step voltage, step voltage change pattern, and step duration
Protocol capacity	10, with up to 9 steps each
Serial port	RS232C*, 1200 or 9600 baud, 8 data bits, 1 stop bit, no parity, no flow control
Physical parameters	
Dimensions (W × H × D)	25 × 14 × 46 cm
Weight	6.8 kg (15 lbs)
Safety	
Safety features	Automatic voltage cutoff when safety lid is opened
Safety certifications	CE 73/23/EEC (LV directive); UL 3101-1; CSA22.2 1010-1

** If multiple Ettan IPGphor 3 IEF units are to be used, an RS232 expansion box is required.*

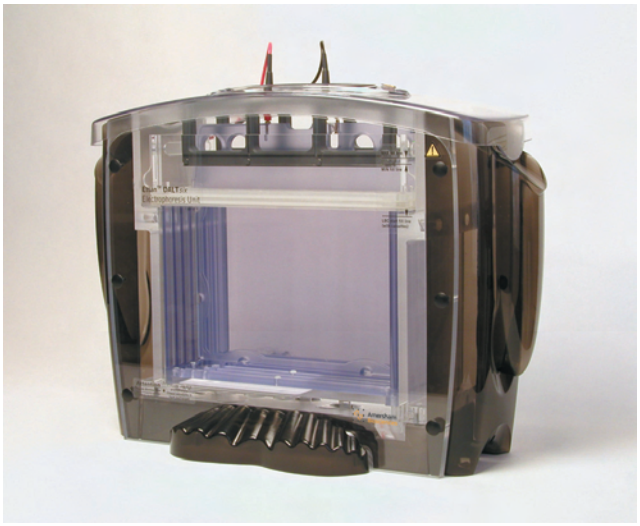
Designed for maximum performance and flexibility, the manifolds can handle 12 IPG strips simultaneously. Sample equilibration can also be performed in the same tray, saving substantial time.

Ettan IPGphor Manifold Light is constructed from a new leading-edge polymeric material and is ideal for routine general screening applications. It is easy to handle and is extremely robust.

The ceramic Ettan IPGphor Manifold exhibits exceptionally uniform thermal characteristics and is designed for the most stringent applications. The high heat conductivity of the ceramic material prevents any "hot spots" that can distort 2-D electrophoresis maps.

Ettan DALT*six* Large Vertical System

DIGE approved



The compact, six-gel capacity Ettan DALT*six* Electrophoresis Unit.

- ***Modular system for large format and medium throughput 2-D electrophoresis.***
- Run up to six lab-cast or precast gels (26 × 20 cm) simultaneously.
- Use with 18- or 24-cm Immobiline DryStrip gels.
- Simple-to-use 1.0-mm or 1.5-mm pre-assembled hinged gel cassettes.
- Innovative design simplifies loading and unloading.
- Built-in ceramic heat exchanger and buffer circulation pump ensure efficient cooling.
- Improved Upper Buffer Chamber in combination with updated protocols will optimize results under the widest variety of run conditions.

Ettan DALT*six* Electrophoresis Unit runs up to six large format (26 × 20 cm) second-dimension polyacrylamide gels in just 4–5 h. The gels accept first dimension 18- or 24-cm Immobiline DryStrip gels (IPG strips) from both Ettan IPGphor and Multiphor II isoelectric focusing systems.

Ettan DALT*six* system is modular in design. The system components include Ettan DALT*six* Electrophoresis Unit, Gel Caster and Gradient Maker, an EPS 601 Power Supply, and MultiTemp III Thermostatic Circulator. All Ettan DALT*twelve* Electrophoresis System accessories, including blank cassette insert, separator sheets, filler sheets, cassette rack, and staining tray set are compatible with Ettan DALT*six* units.

The DALT*six* Gradient Maker is designed to produce linear, convex and concave exponential gradients of solutions ranging in volume from 200 to 1000 ml. A sliding valve at the bottom quickly connects or disconnects the chambers.

ORDERING INFORMATION

Product	Quantity	Code Number
Ettan DALT*six* Electrophoresis Unit, 115 V	1	80-6485-08
Includes: Two pieces vinyl tubing, two complete male-female Quickfit connectors, and cassette removal tool		
Ettan DALT*six* Electrophoresis Unit, 220 V	1	80-6485-27
Includes: Two pieces vinyl tubing, two complete male-female Quickfit connectors, and cassette removal tool		
Ettan DALTsix Upper Buffer Chamber *NEW*	1	28-9057-86
DALT Precast Gel Cassette	1	80-6466-65
DALT Gel 12.5 (26 × 20 cm)	6	17-6002-36
DALT Buffer Kit for 12 precast gels	1	17-6002-50
DALT Gel Casting Cassette 1.0 mm	1	80-6466-84
DALT Gel Casting Cassette, 1.5 mm	1	80-6488-69
Low-fluorescence Glass Plates, 27 × 21 cm, for Ettan DALT (including spacers)	1	80-6475-58
(low-fluorescence glass for use with fluorescent dyes)		
DALT Glass Plate Set, including spacers	1	80-6475-39
(regular glass plates for spot picking)		
DALT Blank Cassette Insert	1	80-6467-03
DALT Separator Sheets 0.5 mm	16	80-6467-41
DALT Filler Sheets 1.0 mm	6	80-6467-60
DALT*six* Gel Caster	1	80-6485-46
Includes: 7 Separator Sheets 0.5 mm and 6 Filler Sheets 1.0 mm. (Order cassettes separately)		
DALT*six* Gradient Maker	1	80-6487-36
Equilibration Tube Set	12	80-6467-79
DALT Cassette Removal Tool	2	80-6474-82
DALT Cassette Rack	2	80-6467-98
Staining Tray Set	1	80-6468-17
Wonder Wedge plate separation tool	1	80-6127-88
Roller	1	80-1106-79

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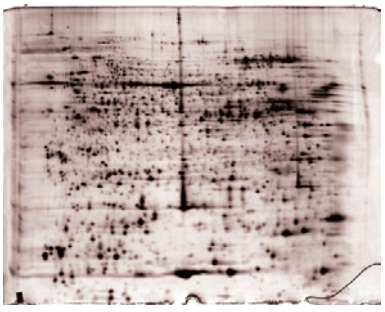
Related Products	Refer To
EPS 601 Power Supply	page 304
MultiTemp III Thermostatic Circulator	page 276
2-D Fluorescence Difference Gel Electrophoresis	page 262
Immobiline DryStrip Gels	page 269
Ettan IPGphor 3 IEF System	page 272
Ettan DALT*twelve* Large Vertical System	page 277

Ettan DALT*six* uses the same convenient pre-assembled gel cassette designs, with hinged plates and permanent spacers, as the original DALT and Ettan DALT*twelve* systems. For lab-cast gels, choose either a 1.0-mm or 1.5-mm gel casting cassette and high quality PlusOne gel casting chemicals. For added convenience, choose precast DALT Gel 12.5 and the 1.0-mm precast gel cassette. Precast DALT gels are barcoded for convenient sample and batch processing.



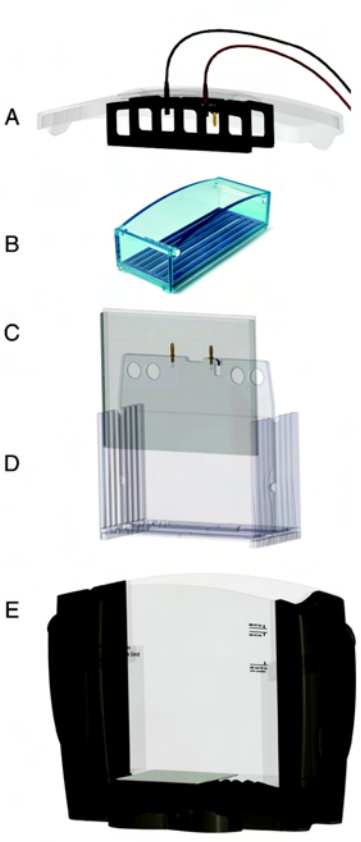
Brussel sprout (*Brassica oleracea* var. *Gemnifera*) extract separated in the first dimension on an Immobiline DryStrip pH 3–10 NL, 24 cm. The second dimension was run on Ettan DALT*six* with a 12.5% T, 2.7% C polyacrylamide gel using the Laemmli buffer system.

Ettan DALT*six* Large Vertical System (continued)

DALT*six* Gel Caster and Gradient Maker

DALT*six* Gel Caster holds up to six 1.0-mm or 1.5-mm cassettes with separator sheets for casting homogeneous or gradient gels. If fewer gels are to be cast, the unused volume is filled with blank cassette inserts and filler sheets.

DALT*six* Gel Caster for casting 1.0- and 1.5-mm large-format gels and DALT*six* Gradient Maker.

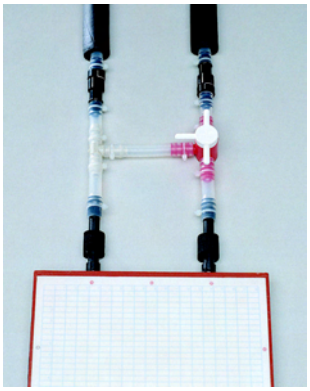


Exploded view of Ettan DALT*six* Electrophoresis Unit. (a) lid with leads and safety interlock; (b) upper buffer chamber; (c) gel cassette; (d) anode assembly/cassette carrier; (e) lower buffer chamber with ceramic heat exchanger and buffer circulation pump.

TECHNICAL SPECIFICATIONS	
Ettan DALT*six* Electrophoresis Unit	
Gel capacity	6 gels
Buffer volume	4.5 l (anode) 0.8 l (cathode)
Circulation pump voltage	115 V/60 Hz or 220 V/50 Hz
Buffer circulation pump rate	10 l/min
Cooling	ceramic heat exchanger
Pressure limit ceramic heat exchanger	8 kPa (12 psi)
Maximum temperature	40°C
Environmental operating conditions	indoor use, 4–40°C; humidity up to 90%; installation category II
Pollution degree	2
Safety features	safety interlock lid, submersive pump
Product and safety certifications	EN61010-1, UL3101-1, CSA22.2 1010.1, EMC EN61326, CE marked
Dimensions (H × W × D)	40 × 54 × 16 cm
Weight	12.2 kg
DALT*six* Gel Caster	
Gel capacity	6 gels, 1.0 mm or 1.5 mm thick
Volume (total acrylamide solution)	425 ml for 1.0 mm thick gels, 550 ml for 1.5 mm thick gels
Dimensions (H × W × D)	27 × 37 × 8 cm
Weight	3.6 kg
1.0 mm Gel Casting Cassettes	
Cassette dimensions (W × H × D)	27.6 × 21.7 × 0.70 cm
Slab gel dimensions (W × H × D)	25.5 × 21.7 × 0.10 cm
1.5 mm Gel Casting Cassettes	
Cassette dimensions (W × H × D)	27.6 × 21.7 × 0.75 cm
Slab gel dimensions (W × H × D)	25.5 × 21.7 × 0.15 cm
DALT*six* Gradient Maker	
Volume	1000 ml
Weight	0.73 kg

MultiTemp III Thermostatic Circulator

DIGE approved Supported by Labcrew



MultiTemp III is a compact and reliable temperature control unit for electrophoresis equipment. The connection to Multiphor II cooling plate is shown above.

- ***Controls coolant temperature from -10°C to +90°C ± 0.1°C.***
- Attached equipment cools quickly with 3-l reservoir capacity.
- Coolant circulates at 12 l/min with internal pump.
- CFC-free refrigerant protects the environment.

MultiTemp III refrigerated bath circulator provides reliable and reproducible temperature control by circulating constant temperature liquid to external electrophoresis equipment. The working temperature range spans requirements from heat sensitive enzyme separations to highly denaturing DNA sequencing. The generous 200 W cooling capacity handles two Multiphor II units. An opening in the reservoir top allows MultiTemp III to be used as a small, high-precision, constant-temperature water bath for bottles and tubes.

MultiTemp III operating parameters are easily set with membrane keys on the control panel. The clear LED display shows set or actual temperature. The stainless steel reservoir is easy to clean and can be quickly drained through a convenient outlet at the front of the unit.

ORDERING INFORMATION

Product	Quantity	Code Number
MultiTemp III Thermostatic Circulator 115 VAC	1	18-1102-77
MultiTemp III Thermostatic Circulator 230 VAC *Includes: Insulation tubing for cooling and 3-way valve set.*	1	18-1102-78
Accessories and Replacement Parts		
Cooling tubing, 8 mm i.d., 12 mm o.d.	4 m	80-1106-56
Tubing connector set, female and male	4	18-1104-26
Insulation for cooling tubing 14 mm i.d., 27 mm o.d.	1.8 m	80-1116-11
3-way valve set	1	18-1106-39
QuickFit Connector, female, 3/8"	2	80-6115-15
QuickFit Connectors, male, 3/8"	2	80-6115-53

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TECHNICAL SPECIFICATIONS

Working temperature range	-10°C to 90°C
Temperature control constancy	< ± 0.1°C at 20°C
Range of temperature limit switch	20°C to 95°C
Heater capacity	800 W
Cooling capacity, 115 VAC	240 W at 20°C 200 W at 5°C
Cooling capacity, 230 VAC	265 W at 20°C 215 W at 5°C
Compressor coolant	KLEA 134a*
Bath volume	3 l
Bath opening/depth	13 × 10/10 cm
Pump capacity, pressure	≈ 0.32 bar
Pump capacity, flow rate	≈ 12 l/min
Noise level at 1 m in front of the unit	< 63 dB(A)
Line voltage	95-132 VAC, 60 Hz 95-125 VAC, 50 Hz 198-253 VAC, 50 Hz
Power consumption	1200 W
Maximum operating ambient humidity	80% at 31°C 50% at 40°C
Operating temperature range	4°C to 40°C
Maximum operating altitude	2000 m
Dimensions (W × D × H)	22 × 42 × 48 cm
Weight	28 kg
Safety certifications	For 230 VAC: CE 89/336/EEC (EMC directive); CE 73/23/EEC (LV directive); EN-61010-1 (IEC1010-1, UL3101-1, CSA22.2 1010-1)

Specifications are for 20°C ambient temperature

** See trademark information at back of catalog*

DIGE approved

Ettan DALT*twelve* Large Vertical System

Ettan DALT*twelve* System can run simultaneously up to 12 large-format gels in 4 to 6 h.

- ***Highest capacity electrophoresis unit with the largest precast gels available (26 × 20 cm).***
- Stable, discontinuous buffer system in a precast, homogeneous gel features high batch-to-batch reproducibility.
- Simple-to-use gel cassettes for gel loading, unloading, and storage.
- Programmable power supply and temperature control ensure high reproducibility among runs.
- System design minimizes buffer consumption.

Ettan DALT*twelve* System streamlines performing second-dimension SDS-PAGE separations. The system increases productivity while delivering high throughput, resolution, and reproducibility. When used in combination with 24 cm Immobiline DryStrip gels, Ettan DALT*twelve* maximizes the number of discrete, quantifiable protein spots obtainable per large-format gel.

Ettan DALT*twelve* System comprises a 12-gel separation unit, programmable power supply/control unit, precast large-format gels, hinged gel cassettes, and 14-gel capacity gel caster.

The separation unit requires only 10 l of buffer, which is circulated by a pump located in the lower chassis of the unit. The Peltier cooling unit at the bottom of the tank precisely controls the temperature over a range of 15°C to 50°C. Up to 12 gels can be run simultaneously with separations complete in 4-6 h.

DALT Gel 12.5 and Buffer Kit
DALT Gel 12.5 (26 × 20 cm) is a precast polyacrylamide gel bound to a plastic support film, which provides ease of handling and dimensional stability. The gels are barcoded for convenient sample and batch tracking. DALT Gel 12.5 is used together with DALT Buffer Kit, which comprises concentrated buffers for running the gel, Gel Buffer for inserting the gel into DALT Precast Gel Cassette, and Sealing Solution for application of the IPG strip. The buffer in the gel is part of a unique buffer system that gives longer shelf-life. Precast gel cassettes improve handling efficiency and throughput. Gels can be quickly loaded and unloaded with minimal hands-on time.

ORDERING INFORMATION

Product	Quantity	Code Number
Ettan DALT*twelve* Separation Unit and Power Supply/Control Unit, 115 V	1	80-6466-46
With buffer circulation pump and Peltier cooling for up to twelve 26 × 20 cm gels		
Ettan DALT*twelve* Separation Unit and Power Supply/Control Unit, 230 V	1	80-6466-27
With buffer circulation pump and Peltier cooling for up to twelve 26 × 20 cm gels		
DALT Gel 12.5 (26 × 20 cm)	6	17-6002-36
DALT Buffer Kit for 12 precast gels	1	17-6002-50
DALT Precast Gel Cassette	1	80-6466-65
DALT Gel Casting Cassette 1.0 mm	1	80-6466-84
DALT Gel Casting Cassette, 1.5 mm	1	80-6488-69
Low-fluorescence Glass Plates, 27 × 21 cm, for Ettan DALT (including spacers)	1	80-6475-58
(low-fluorescence glass for use with fluoroscent dyes)		
DALT Glass Plate Set, including spacers	1	80-6475-39
(regular glass plates for spot picking)		
DALT Blank Cassette Insert	1	80-6467-03
DALT*twelve* Gel Caster, complete	1	80-6467-22
DALT Separator Sheets 0.5 mm	16	80-6467-41
DALT Filler Sheets 1.0 mm	6	80-6467-60
DALT Cassette Removal Tool	2	80-6474-82
DALT Buffer Seal Removal Tool	2	80-6474-63
DALT Cassette Rack	2	80-6467-98
Staining Tray Set	1	80-6468-17
DALT Gradient maker with Peristaltic Pump 115 VAC	1	80-6067-65
DALT Gradient maker with Peristaltic Pump 230 VAC	1	80-6067-84

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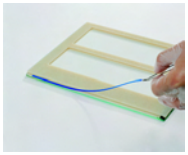
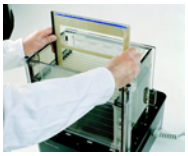
Related Products	Refer To
2-D Fluorescence Difference Gel Electrophoresis	this chapter
Ettan DALT*six* Large Vertical System	page 274
Ettan IPGphor 3 IEF System	page 272
Immobiline DryStrip Gels	page 269
DeStreak Rehydration Solution	page 269

DALT Gel 12.5 (26 × 20 cm) and DALT Buffer Kit use a proprietary buffer formulation for long shelf-life and high reproducibility.

Ettan DALT*twelve* Large Vertical System (continued)

Precast gels load easily into Ettan DALT Precast Gel Cassettes—no glass plate assembly required.





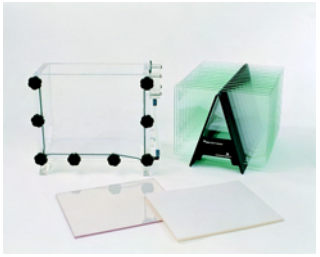
After a precast gel is loaded, the IPG strip is added, sealed into position, and the cassette is placed into the Ettan DALT*twelve* Separation Unit.

DALT*twelve* Gel Caster

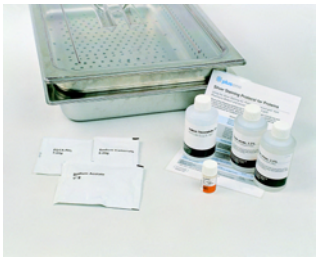
For added flexibility, DALT*twelve* Gel Caster is available for casting up to 14 gels simultaneously. Regular and low-fluorescence glass plates are available for use with the DALT Gel Casting Cassette. Low-fluorescence glass plates ensure high sensitivity when using fluorescent dyes. Gradient gels can be prepared using DALT Gradient Maker.

Multiple Gel Staining with Ettan Staining Tray Set

After the second-dimension run is complete, the large-format gels can be stained using DALT Staining Tray Set and PlusOne Silver Staining Kit, Protein. This combination ensures reliable detection with high sensitivity.



Cast gels using DALT*twelve* Gel Caster and choose between low-fluorescence or regular glass plates.



DALT Staining Tray Set and PlusOne Silver Staining Kit, Protein deliver reliable detection and high sensitivity.

TECHNICAL SPECIFICATIONS	
Ettan DALT*twelve* Separation Unit	
Gel capacity	12 gels
Buffer volume	10 l
Buffer circulation pump rate	10 l/min
Cooling	Integrated Peltier
Ettan DALT*twelve* Power Supply/Control Unit	
Voltage	600 VDC
Current	1.00 A
Power	200 W
Temperature control range	10°C to 50°C
Programmable parameters	Run type, timer, pump, temperature
Operating temperature	4°C to 40°C
Line voltage	115 V: 90–130 VAC, 60 Hz, 650 W 230 V: 180–230 VAC, 50–60 Hz, 650 W
Safety features	Automatic voltage shut-off when lid is opened
Safety certifications	EN61010-1, UL3101-1, CSA22.2 1010.1, EMC EN61326, CE marked
DALT Gel 12.5	
Separation range (M_r in thousands)	12–120
Dimensions (W × L × T)	255 × 196 × 1 mm
Separating zone	12.5% T/3% C
Gel buffer	Special buffer based on piperidinopropionamide (PPA)*
Gel backing (W × L)	Polyester film (265 × 211 mm)
DALT Buffer Kit	
Anode Buffer (100×)	5 M diethanolamine (DEA), 5 M acetic acid
Cathode Buffer (10×)	0.25 M Tris, 1.92 M glycine, 1% (w/v) SDS
Gel Buffer	Special buffer based on piperidinopropionamide (PPA)*
Sealing Solution	As Gel Buffer with 0.5% agarose and 0.002% bromophenol blue.
DALT*twelve* Gel Caster	
Capacity	14 gels
Slab gel dimensions using Gel Caster Cassette (W × L × T)	255 × 205 × 1 mm

**The buffer system in this gel and buffer kit is covered by pending patent applications covering the US, EPO, and Japan, which correspond to WO 9616724*

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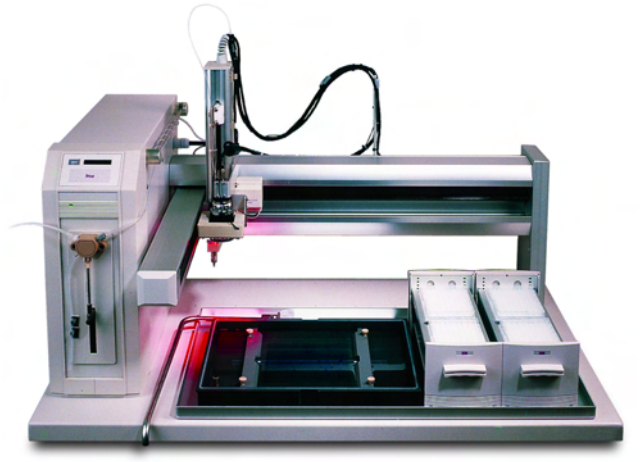
Ettan Spot Picker



Ettan Spot Picker performs accurate and reliable picking of gel electrophoresis spots.

- ***Automatically picks selected protein spots from stained or destained gels, with greater than 99.9% efficiency.***
- Designed for use with backed and nonbacked gels.
- Compatible with common detection systems and scanners.
- Seamless integration with DeCyder 2-D Differential Analysis Software.

Ettan Spot Picker is a robotic system designed to accurately pick protein spots from 2-D gels, and transfer the picked proteins into microplate wells in preparation for further analyses, such as digestion and protein identification by MALDI mass spectrometry.

Polyacrylamide 2-D gels stained with common detection stains, such as silver, Coomassie or fluorescent dyes are scanned, and data can be analyzed using ImageMaster 2D Platinum Software or DeCyder 2-D Differential Analysis Software. A protein picklist is generated, either automatically using predefined selection criteria, or manually. The protein picklist is transferred to Ettan Spot Picker, which then automatically picks the protein spots according to the list. Attaching self-adhesive reference markers to the gel backing prior to scanning the gel ensures a precise link between electronic image and actual gel.

A wash step is performed after each picking session, and the location of each picked protein in its respective microplate well is automatically logged to facilitate sample tracking.

When picking a limited number of protein spots, or for pooling of samples, the software also includes a "click-and-pick" function whereby proteins can be picked without an ImageMaster-generated picklist.

Ettan Spot Picker is compatible with large-format DALT precast gels, self-cast gels, and nonbacked gels. Gels cast on backing provide stable gel dimensions during spot picking. During the picking process, gels are covered by liquid to eliminate gel drying. Nonbacked gels are also easily handled using the Ettan Spot Picker Nonbacked Gel Kit.

Ettan Spot Picker is supplied with 1.4 mm and 2.0 mm picker heads, reference markers, gel holders, gel tray, and microplate racks. A Protective Hood, which minimizes risk of gel contamination, is optional.

ORDERING INFORMATION

Product	Quantity	Code Number
Ettan Spot Picker	1	18-1145-28
Including computer and monitor		
Accessories		
Target Layout Upgrade Software	1	11-0002-94
Picker Head 1.4 mm for 1 mm thick gels	1	18-1147-03
Picker Head 1.4 mm for 1.5 mm thick gels	1	18-1147-05
Picker Head 2.0 mm for 1 mm thick gels	1	18-1143-64
Picker Head 2.0 mm for 1.5 mm thick gels	1	18-1143-37
Reference Markers (560/sheet)	2	18-1143-34
Gel Holder	2	18-1143-50
Gel Tray	1	18-1143-38
Glass Lid for Gel Tray	1	18-1143-32
Syringe, 1 ml	1	18-1143-41
Waste Bottle and Tubing	1	18-1143-44
Tubing and Fitting	1	18-1143-63
Inlet Tubing Package	1	18-1143-65
Rinse Station	1	18-1143-31
Camera Calibration Foot	5	18-1143-33
White Sheet for Camera Calibration and Click-and-Pick Function	2	18-1143-51
Microplate Rack	1	18-1143-43
RS232 Cable	1	18-1143-45
Protective Hood	1	18-1149-17

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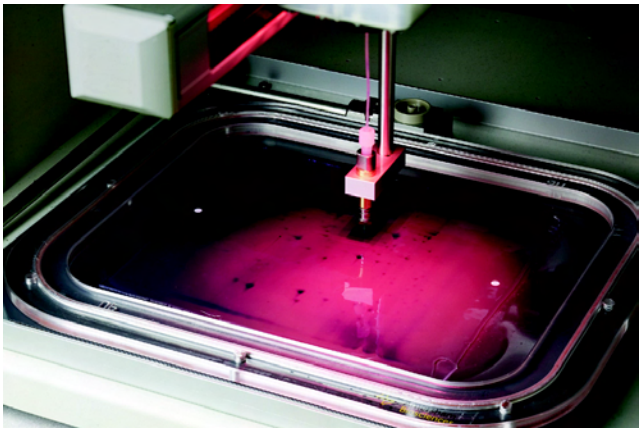
Related Products	Code Number	Refer To
Ettan DALT*twelve* Large Vertical System		page 277
DALT Gel 12.5 (26 × 20 cm)	17-6002-36	page 277
DALT Buffer Kit for 12 precast gels	17-6002-50	page 277
Immobiline DryStrip Gels		page 269
ImageMaster 2D Platinum v6.0		page 268
DeCyder 2-D Differential Analysis Software v6.5		page 265
ImageScanner III	28-9076-07	page 387
Typhoon Multislide Tray		page 378
Ettan Digester		page 281
Ettan Spotter		page 282
Ettan Spot Picker Nonbacked Gel Kit		page 280

TECHNICAL SPECIFICATIONS

Sample source	Polyacrylamide gels cast on glass, GelBond PAGfilm backing, or nonbacked gels
Max. gel size	280 × 250 mm 1-, 1.5-mm gel thickness compatibility
Picker head diameter	1.4, 2.0 mm
Picking efficiency	> 99.9% of spots transferred from gel to microplate
Picking capacity	9600 protein spots/pick list
Process capacity	96 samples in less than 30 min
Detection system compatibility	Silver, Coomassie, fluorescence
Operating temperature	18°C to 30°C
Max. relative humidity	80% noncondensing
Air pressure	75–105 kPa (up to 2000 m altitude)
Mains voltage	110–120 VAC ±10%, 50/60 Hz, or 220–240 VAC ±10%, 50 Hz, single phase (installation category II)
Mains fuse	2 A@110 VAC, or 1 A@220 VAC
Power comsumption	Max. 200 VA
Safety	UL 1260, UL 1492 (camera), CSA C22.2-No.151, IEC 1010-1
EMC	EN 50082-1, EN 50022 (framegrabber), FCC Class A
EMI	EN 50081-1, EN 50024 (framegrabber)
Dimensions (W × D × H)	91 × 61 × 56 cm
Weight	41 kg

Automated Gel Handling

Ettan Spot Picker Nonbacked Gel Kit



Automated spot picking using the Ettan Spot Picker Nonbacked Gel Kit.

- ***Allows quick and accurate protein spot picking from nonbacked 2-D gels, increasing the versatility of Ettan Spot Picker.***
- Compatible with common staining methods such as silver, Coomassie Blue, fluorescence, and labeling with Ettan DIGE Fluor dyes.
- High-precision picking with reference markers—using the Gel Frame, a nonbacked gel slab is attached to a temporary cellophane backing supporting the reference markers.
- Improves nonbacked gel handling during scanning and the Glass Lid protects the moist gel.

ORDERING INFORMATION

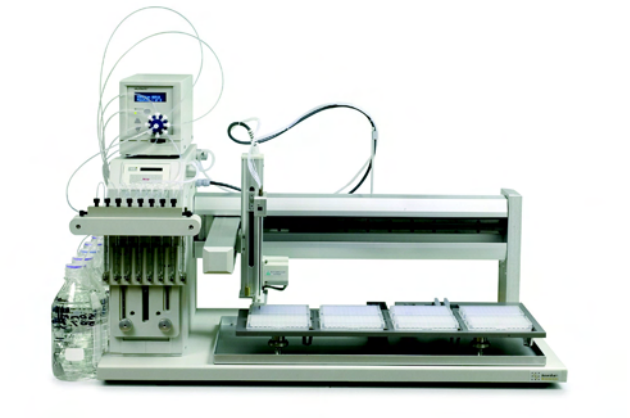
Product	Quantity	Code Number
Ettan Spot Picker Nonbacked Gel Kit	1	**11-0002-93**
Porous Cellophane Backing, 34 × 44 cm	50 sheets	**80-6117-81**

For pricing information, visit www.gelifesciences.com/orderonline

Related Products	Code Number	Refer To
Ettan Spot Picker	18-1145-28	page 279
Picker Head 1.4 mm for 1 mm thick gels	18-1147-03	page 279
Picker Head 1.4 mm for 1.5 mm thick gels	18-1147-05	page 279
Picker Head 2.0 mm for 1 mm thick gels	18-1143-64	page 279
Picker Head 2.0 mm for 1.5 mm thick gels	18-1143-37	page 279
Reference Markers	18-1143-34	page 279

DIGE approved Supported by Labcrew

Ettan Digester



Ettan Digester enables robust in-gel digestion of proteins prior to MALDI analysis.

- ***For in-gel digestion of proteins from 2-D electrophoresis gel plugs.***
- Improved design allows robust and reproducible digestion, sensitive down to the 100-fmol range*.
- Special needle design minimizes plug loss.
- Preprogrammed optimized protocols.
- No need for C18 cleanup, salt level controlled by preinstalled methods.
- Processing of up to 384 (4 × 96) samples simultaneously in less than 8 h.

Ettan Digester is a highly versatile instrument designed to perform in-gel digestion of proteins captured in 2-D gel electrophoresis spots. The instrument acts directly on Ettan Spot Picker output files, automatically tracking samples from spot picking to completed digestion using simple "plug-and-play" routines.

Default digestion protocols are optimized and compatible with Coomassie, silver, and fluorescence staining systems. A method editor also allows customization of methods. Standard microplates further increase ease of use, as do low-salt digestion buffers, which eliminate the need for desalting.

Eight samples are handled in parallel and 384 samples can be processed in less than 8 h.

Ettan Digester is supplied with computer and monitor, control software, 500-µl syringe, needles, enzyme tube holder, enzyme tubes, calibration plate, calibration tool, tubing kit, tubings and fittings, and waste bottle. A protective hood, which minimizes risk of contamination, is optional.

** 100 fmol of phosphorylase B or BSA in an SDS gel plug could be identified by loading 10% of the resulting digested peptide mix onto the MALDI target*

ORDERING INFORMATION

Product	Quantity	Code Number
Ettan Digester *Including computer and monitor*	1	**18-1142-68**
Accessories		
Enzyme container (48)	1	**18-1157-75**
Enzyme tube	1000	**18-1175-81**
Enzyme tube holder	1	**18-1175-82**
Syringe 500 µl	1	**18-1143-56**
Needle, Digester	2	**18-1143-57**
Tubing and fitting, Digester	1	**18-1143-62**
Tubing kit	1	**18-1152-64**
Waste Bottle and Tubing	1	**18-1143-44**
Screw cap with Hole	1	**18-1155-36**
Calibration plate	1	**18-1156-66**
Calibration tool	1	**18-1175-79**
Sealing foil	100	**18-1143-54**
Protective Hood	1	**18-1149-17**

For pricing information, visit www.gelifesciences.com/orderonline

Related Products	Code Number	Refer To
Ettan Spot Picker	18-1145-28	page 279
Ettan Spotter		page 282

TECHNICAL SPECIFICATIONS

Sample source	Polyacrylamide gel plugs in microplates
Sample handling	8 samples simultaneously
Detection system compatibility	Silver, Coomassie, or fluorescence
Digestion capacity	384 samples per batch
Process capacity	384 samples in less than 8 h (digestion 37°C; 2 h; Coomassie/SYPRO stained gel)
Sensitivity	100 fmol of phosphorylase B or BSA in an SDS gel plug could be identified by loading 10% of the resulting digested peptide mix onto the MALDI–ToF target
Operating temperature	18°C to 30°C (65°F to 86°F)
Maximum relative humidity	80% noncondensing
Air pressure	75–105 kPa (up to 2000 m altitude)
Mains voltage	100–120 V or 220–240 V ±10%, 50/60Hz, single phase
Mains fuse, Digester/MultiValve	1 × T2 A @ 110 V, or 2 × T2 A @ 220 V
Power consumption	Max. 200 VA
Safety	UL 1260, CSA C22.2 – No. 151, IEC 1010–1
EMC	EN 50082–1, FCC Class A
EMI	EN 50081–1
Dimensions (W × H × D)	91 × 56 × 61 cm
Weight	53 kg

Automated Gel Handling

Ettan Spotter

DIGE approved

Supported by Labcrew

Ettan Spotter automatically spots protein samples and matrix onto MALDI MS targets.

- ***Robotic instrument designed to automatically mix and spot digested proteins and matrix onto any MALDI MS targets.***
- Easy to set up and run, acts directly on Ettan Digester output files.
- Special needle design with hydrophobic coating to eliminate cross-contamination.
- Automatically spots 384 samples/batch in less than 3 h.

Ettan Spotter is designed to reproducibly spot protein samples and matrix on multiple MALDI MS targets for subsequent analysis by mass spectrometry. Samples are presented to the Ettan Spotter in 96-well microplates. The instrument acts directly on Ettan Digester output files, which provides automated sample tracking from spot picking through to digestion and completion of spotting. The easy-to-use software allows the selection of default or customizable spotting methods. Ettan Spotter uses a single needle for spotting which is overlaid with a hydrophobic coating for eliminating cross-contamination between samples as well as any carryover of liquid. The needle is automatically washed after spotting a sample.

There is no need for a desalting step prior to spotting since salt levels are controlled during the digestion methods used in Ettan Digester. The software enables the sample to be spotted twice on the MALDI target in order to allow sample concentration.

Up to 384 samples can be spotted in automated mode. Throughput is determined by the number of microplates used (up to four microplates can be used) with digested material that can be fitted onto the platform.

Ettan Spotter is supplied with computer and monitor, control software, 100-µl syringe, needle, vial with cap, and tubings and fittings. A protective hood, which minimizes the risk of contamination, is optional.

ORDERING INFORMATION

Product	Quantity	Code Number
Ettan Spotter *Includes computer and monitor*	1	**18-1142-67**
Accessories		
MS sample tray, Bruker (without target)	1	**18-1155-99**
MS sample tray, Micromass (without target)	1	**18-1156-00**
MS sample tray, Voyager (without target)	1	**18-1156-02**
MS sample tray, Shimadzu (without target)	1	**11-0006-79**
Target Layout Upgrade Software	1	**11-0002-94**
Vial with cap, 1 ml	100	**18-1152-75**
Needle	1	**18-1149-56**
Tubing and Fittings	1	**18-1156-30**
Ettan Sample Slide Kit	2	**18-1147-18**
Syringe, 100 µl	1	**18-1143-55**
Screw cap with Hole	1	**18-1155-36**
Waste Bottle and Tubing	1	**18-1143-44**
Protective Hood	1	**18-1149-17**

For pricing information, visit www.gelifesciences.com/orderonline

Related Products	Code Number	Refer To
Ettan Spot Picker	18-1145-28	page 279
Ettan Digester	18-1142-68	page 281

TECHNICAL SPECIFICATIONS

Sample source	Microplates with peptide or protein samples, dried or in solution
Spotting capacity	384 samples (batch mode), 96 samples (manual mode)
Process capacity	Depends on method used; 96 samples, in less than 45 min if 'Dissolve in matrix first' is used.
Operating temperature	18°C to 30°C (65°F to 86°F)
Maximum relative humidity	80% noncondensing
Air pressure	75–105 kPa (up to 2000 m altitude)
Mains voltage	100–120 V or 220–240 V ±10%, 50/60Hz, single phase
Mains fuse	2 A @ 110 V, or 1 A @ 220 V
Power consumption	Max. 200 VA
Safety	UL 1260, CSA C22.2 – No. 151, IEC 1010–1
EMC	EN 50082–1, FCC Class A
EMI	EN 50081–1
Dimensions (W × D × H)	91 × 61 × 56 cm
Weight	41 kg

Introduction to Vertical Electrophoresis Units

SELECTION GUIDE BY TECHNICAL OVERVIEW – Vertical Electrophoresis Units

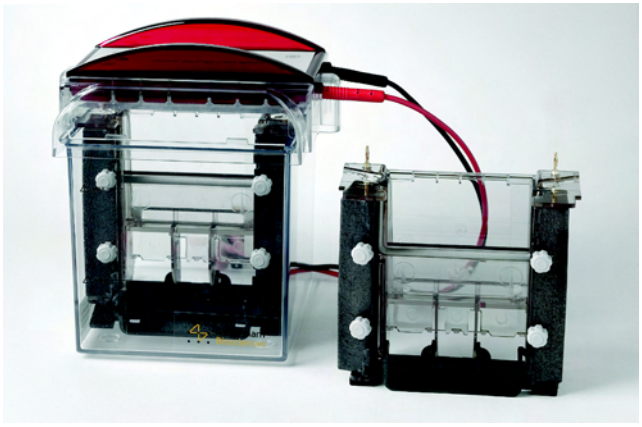
Model	Gel Size (W × L, cm)	Glass Plate Size (W × L, cm)	No. of Gels	Heat Exchanger	Maximum Samples/Gels
Mini format					
miniVE	8 × 9.5	10 × 10.5	1–2	N	18
SE 250	8 × 7	10 × 8	1–2	Y	18
SE 260	8 × 7 or 9.5	10 × 8 or 10.5	1–2	Y	18
Standard 16-cm long format					
SE 400	14 × 16	18 × 16	1–2*	N	28
SE 600 Ruby	14 × 16 or 8	18 × 16 or 8	1–4*	Y	28
Standard 24-cm long format					
SE 660	14 × 24, 16 or 8	18 × 24, 16, or 8	1–4*	Y	28

** Optional divider plate doubles capacity*
For general information concerning electrophoresis of proteins, see Technical Appendix

TECHNICAL SPECIFICATIONS

Safety certifications	All Vertical Units have the following safety certifications: CE 73/23/EEC (LV directive); EN-61010-1 (IEC1010-1, UL3101-1, CSA22.2 1010-1).

miniVE Vertical Electrophoresis System



Perform electrophoresis and electrotransfer using the compact miniVE Vertical Electrophoresis System, shown here with two gel modules and optional blot module.

- ***Perform 1-D and 2-D electrophoresis and electrotransfer in a single compact unit.***
- Cast, run, and blot mini-gels in four streamlined components: gel module, blot module, lower buffer chamber, safety lid.
- Run two mini-gels or four mini-blots at once, using 10 × 10.5-cm gel cassettes for increased separation distances.
- Complete semi-wet blotting in 45 min with only 300 ml buffer.
- Choose precast gels from a variety of manufacturers.
- Perform two second-dimension separations using 7-cm IPG strips in 1.5 h.

ORDERING INFORMATION

Product	Quantity	Code Number
miniVE Vertical Electrophoresis Systems		
miniVE, Complete	1	**80-6418-77**
Includes: 3 rectangular glass plates, 3 notched plates, 2 gel modules, lid, lower buffer chamber, 2 each 1.0 mm thick 10 well combs and 1.0 mm thick spacer sets		
Blot module	1	**80-6418-96**
Includes: 3 Dacron sponges (1/4" thick), 25 sheets of blotter paper		
4-Gel Caster Complete*	1	**80-6146-12**
Includes: 5 rectangular glass plates, 4 notched alumina plates, 100 sheets wax paper, spacesaver plate, 5 filler sheets, and set of filler plugs		
Rectangular glass plates, 10 × 10.5 cm	5	**80-6150-87**
Notched glass plates (10 × 10.5 cm)	5	**80-6150-49**

For pricing information, visit www.gelifesciences.com/orderonline

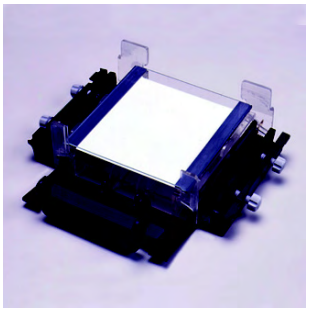
** Order combs and spacers separately. miniVE Vertical Electrophoresis System is compatible with teflon combs, spacers, and glass and alumina plates for SE 260 Mini-Vertical Units, see page 286*

Related Products	Code Number	Refer To
EPS 301 Power Supply	18-1130-01	page 304
EPS 2A200 Power Supply	80-6406-99	page 305
Electrophoresis Reagents		page 306
Rainbow Molecular Weight Markers *IMPROVED*		page 316
PlusOne Silver Staining Kit, Protein	17-1150-01	page 368
Amersham Blotting, Labeling & Detection		Chapter 9
ECL Kits		Chapter 9
SE 250 and SE 260 Accessories		page 286
Amersham ECL Plex Western Blotting Combination Packs		page 354
SE 100 Plate Washer and Storage Unit		page 290

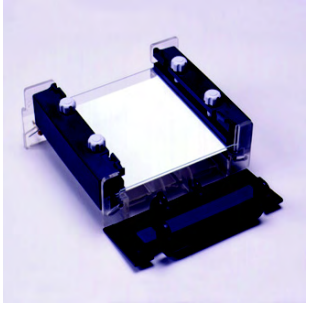
Mini-Format Vertical Units

miniVE Vertical Electrophoresis System (continued)

Convenient Design
The simple, modular design of miniVE Vertical Electrophoresis System consolidates all the small parts for electrophoresis and blotting into one convenient unit. Uniform gel temperature is maintained with the tank-style lower buffer chamber. A full tank stabilizes the temperature so that lanes are straight and bands are flat. The Blot Module will accept two gel/membrane stacks simultaneously. The lower buffer chamber is designed to hold two Blot Modules, allowing four gels to be blotted at once.



Casting gels for miniVE System is as easy as load, ...



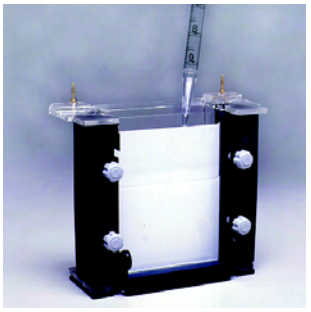
... clamp, ...

Extra Length and Compatible Dimensions
The miniVE handles gel cassettes up to 10 × 10.5 cm (W × H), which increases the separation length by more than 30% over conventional 10 × 8 cm gels. In addition, miniVE is compatible with the glass plates, combs, and spacers of SE 260 Mini-Vertical units. For gradient gels, mini-Vertical Gel Casters can produce up to four identical gels at one time.

The Right Power Supplies
EPS 301 is the power supply of choice for the miniVE System. With ratings of 300 V and 400 mA, it is capable of both running and blotting gels. For faster transfers when blotting four gels at a time, use the EPS 2A200 for its higher current capability.

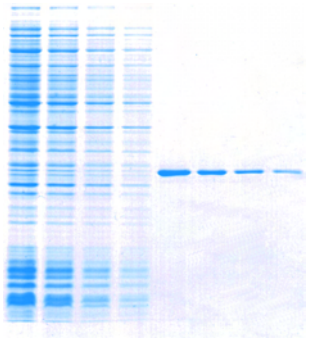
Load, Clamp, and Cast
The gel module is simultaneously a casting stand and an upper buffer chamber with integrated clamps. Simply assemble the gel sandwich of plates and spacers, clamp it onto the upper buffer chamber, then pivot the sealing gasket and cast the gel. After polymerization, simply release the bottom seal and drop the assembly into the tank for running. No extra parts are needed and no unclamping until the run is finished.

miniVE System Blot Module can accept two gel/membrane stacks simultaneously.



... and cast.

Detection of *E. coli* GroEL following Western transfer in miniVE Blot Module. Two-fold serial dilutions of a crude protein extract were separated on a 12% polyacrylamide SDS gel run on miniVE. Proteins were transferred to Hybond-P membrane using miniVE Blot Module. GroEL was detected using an anti-GroEL antibody, ECL Plus Western Blotting Detection System, and Hyperfilm ECL.



Two-fold serial dilutions of a crude *E. coli* protein extract and samples of purified recombinant green fluorescent protein were separated on a 12% polyacrylamide SDS gel run on miniVE. Gel was stained with Coomassie Blue.

Mini-Vertical Units SE 250 and SE 260

SE 250 (left) and SE 260 (right) Mini-Vertical Units provide fast electrophoresis results in less than 45 min.

- ***Premium, multi-option, mini-vertical electrophoresis unit.***
- Choose the SE 250 for fast results using a 10 × 8-cm mini-gel format, or the SE 260 for higher resolution using a 10 × 10.5-cm gel format.
- Run two gels at once in a single unit, and rely on the efficient cooling system to deliver flat, side-by-side sample lanes with no smiling.
- Assemble gel sandwiches and electrophoresis units quickly and easily using T-shaped spacers and specially designed clamps with integral springs.
- Cast up to four gels at once using a variety of casting stands or use precast gels from other manufacturers.
- Trust the safety lid interlocks to prevent accidental operator contact.

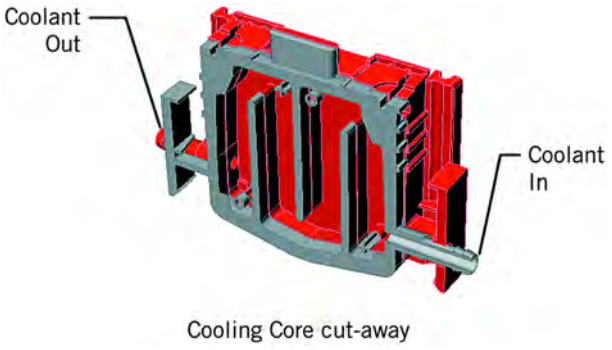
SE 260 Mini-Vertical Unit offers the combined advantages of small format and efficient cooling — an ideal combination for rapid screening of protein and nucleic acid samples. Gels are efficiently cooled using the heat-conductive alumina gel plate and built in heat-exchanger, with or without connection to an external circulator. The alumina back plate of each gel sandwich is in contact with buffer in one of the two buffer chambers, which act as heat sinks. The alumina plate conducts heat away from the gel sandwich into the upper buffer at a rate 40-times faster than glass of comparable thickness. In addition, a serpentine channel through which coolant can be pumped is permanently sealed between the two upper buffer chambers.

ORDERING INFORMATION

Product	Quantity	Code Number
SE 250 Mini-Vertical Unit for two slab gels, complete	1	**80-6147-45**
Includes: Basic unit, 10 glass plates, two alumina notched plates, well-locating decal, SE 245 Dual Gel Caster, two each 0.75-mm thick 10-well combs, and 0.75-mm thick spacer set		
SE 260 Mini-Vertical Unit for two slab gels, complete	1	**80-6149-35**
Includes: Basic unit, 10 glass plates, two alumina notched plates, well-locating decal, SE 245 Dual Gel Caster, two each 0.75-mm thick 10-well combs, and 0.75-mm thick spacer set		

For pricing information, visit www.gelifesciences.com/orderonline

Related Products	Code Number	Refer To
EPS 301 Power Supply	18-1130-01	page 304
Rainbow Molecular Weight Markers ***IMPROVED***		page 316
SE 100 Plate Washer and Storage Unit	80-6116-29	page 290
TE 22 Mini Tank Transfer Unit	80-6204-26	page 347
Electrophoresis Reagents		page 306
Amersham ECL Plex Western Blotting Combination Packs		page 354



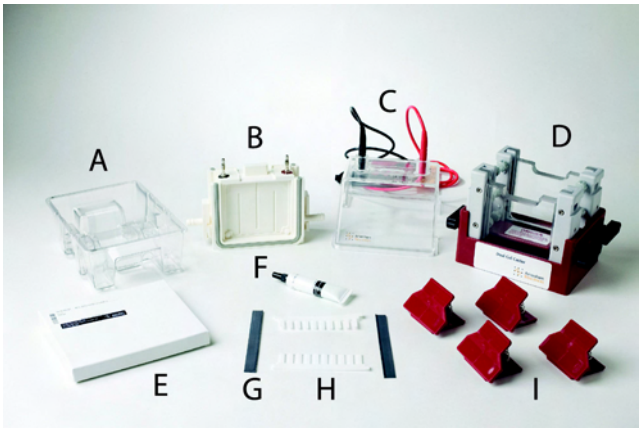
A serpentine channel passes between the two upper buffer chambers of SE 260 Mini-Vertical Unit, ensuring efficient cooling.

Blotting

For efficient electrotransfer of up to four gels at once with the TE 22 Mini Tank Transfer Unit, see page 347.

Mini-Format Vertical Units

SE 250 and SE 260 Accessories



SE 250 and SE 260 components
A. Deep lower buffer chamber for 10.5 cm gels
B. Upper buffer chamber
C. Lid assembly
D. Mini-Vertical Gel Caster
E. Glass plates
F. Gel seal
G. Spacers, various
H. Combs, various
I. Clamps

ORDERING INFORMATION

Product	Quantity	Code Number
Clamps		
Red clamps for SE 260 and gel casters	4	80-6147-83
Electrophoresis Unit Replacement Parts		
Foam gasket, 4.5 mm o.d. × 61 cm long	1	80-6137-19
Upper buffer chamber for SE 250 and SE 260	1	80-6148-40
Lower buffer chamber for SE 250	1	80-6148-59
Deep lower buffer chamber for SE 260	1	80-6148-78
Lid with cables for SE 250 and SE 260	1	80-6149-16
Wonder Wedge plate separation tool	1	80-6127-88
Gel Seal	1	80-6421-43

For pricing information, visit www.gelifesciences.com/orderonline

ORDERING INFORMATION

Wells					
No.	Thickness (mm)	Width (mm)	Vol. of sample per 1 mm depth (µl)	Quantity	Code Number
Teflon combs					
5	0.75	13.0	9.5	1	80-6140-23
5	1.00	13.0	12.7	1	80-6140-42
5	1.50	13.0	19.1	1	80-6140-61
9*	1.00	5.8	5.8	1	80-6140-80
10	0.75	4.8	3.6	1	80-6138-71
10	1.00	4.8	4.8	1	80-6138-90
10	1.50	4.8	7.2	1	80-6139-09
15	0.75	2.9	2.2	1	80-6139-47
15	1.00	2.9	2.9	1	80-6139-66
15	1.50	2.9	4.4	1	80-6139-85
18*	1.00	2.9	2.9	1	80-6140-04
1/1†	0.75	68/5	50/3.5	1	80-6141-56
1/1†	1.00	68/5	65/5	1	80-6141-75
1/1†	1.50	68/5	100/7.5	1	80-6141-94

	Thickness (mm)	Length (cm)	Quantity	Code Number
Spacers				
	0.75	8	2	80-6137-95
	1.00	8	2	80-6138-14
	1.50	8	2	80-6138-33
	0.75	10.5	2	80-6149-92
	1.00	10.5	2	80-6150-11
	1.50	10.5	2	80-6150-30

Product	Quantity	Code Number
Glass and Alumina Plates, 10 × 8 cm (W × L) for SE 250		
Notched alumina plates	10	80-6136-43
Rectangular glass plates	10	80-6136-81
Glass and Alumina Plates, 10 × 10.5 cm (W × L) for SE 260		
Notched alumina plates	5	80-6150-68
Rectangular glass plates	5	80-6150-87

For pricing information, visit www.gelifesciences.com/orderonline

** Microplate spacing*
† Preparative/reference wells

Mini-Vertical Gel Casters

- ***Cast up to 10 gels at once.***
- Use with SE 250, SE 260, and miniVE Vertical Units.

ORDERING INFORMATION

Product	Quantity	Code Number
Gel Casters –		
– for 1 or 2 gels, 10 × 10.5 cm plates		
Dual Gel Caster	1	80-6146-50
– for 2–4 gels, 10 × 10.5 cm plates		
4-Gel Caster Complete*	1	80-6146-12
– for 2–4 gels, 10 × 8 cm plates		
Mighty Small 4-Gel Caster, Complete* for SE 250	1	80-6151-06
Includes: 5 rectangular glass plates, 4 notched alumina plates, 100 sheets wax paper, space-saver plate, 5 filler sheets, and set of filler plugs		
– for 4–10 gels, 10 × 8 cm plates		
Mighty Small Multiple Gel Caster, Complete	1	80-6142-51
Includes: 10 notched alumina plates, 20 rectangular glass plates, 2 red clamps, 100 sheets wax paper, space-saver plate, 5 filler sheets, set of filler plugs and Spacer-Mate assembly template. (Order combs and spacers separately.)		

For pricing information, visit www.gelifesciences.com/orderonline

** Order combs and spacers separately.*

SELECTION GUIDE – Gel Casting Options

	Mini-Vertical unit		
No. of gels	miniVE	SE 250	SE 260
1 or 2	Dual Gel Caster (80-6146-50)	Dual Gel Caster (80-6146-50)	Dual Gel Caster (80-6146-50)
2–4	4-Gel Caster (80-6146-12)	4-Gel Caster (80-6151-06)	4-Gel Caster (80-6146-12)
4–10	-	Multiple Gel Caster (80-6142-51)	-

ORDERING INFORMATION

Product	Quantity	Code Number
Caster Accessories and Replacement Parts		
Wax paper sheets, for 10 × 10.5 cm	100	80-6145-55
Wax paper sheets, for 10 × 8 cm	100	80-6135-67
Filler sheets, for 10 × 10.5 cm	5	80-6145-93
Foam gasket, 4.5 mm o.d. × 61 cm long	1	80-6137-19
Space-saver plate, for 10 × 10.5 cm	1	80-6146-31
Sealing gasket set, for Dual Gel Caster	2	80-6146-69
Casting clamp assembly, for Dual Gel Caster	1	80-6147-07
Silicone rubber filler plug set, for 4-Gel Caster (10 × 8 cm and 10 × 10.5 cm)	1	80-6151-44

For pricing information, visit www.gelifesciences.com/orderonline

SE 600 Ruby and SE 660 Dual Cooled Vertical Units

DIGE approved

SE 600 Ruby for running 8 or 16 cm long gels.

- ***Run denaturing and native polyacrylamide, 2-D, electrophoresis, agarose, and nucleic acid gel electrophoresis.***
- Maintain temperature between 1 and 45°C with built-in heat exchanger for faster runs with no sacrifice in quality.
- Run two gels simultaneously—or run four gels using accessory divider plates.
- Cast single or multiple gels in the two-place casting stand or in the four-gel or ten-gel accessory casters.
- Perform second-dimension separations using two 7-cm IPG strips side-by-side, allowing eight second-dimension separations at once.
- Cast and run wide mini gels using 8-cm glass plates and clamps.

The key to outstanding, reproducible electrophoresis results is temperature control. Gels unequally cooled on their two faces produce slanted bands appearing as broad or double bands in stained gels.

SE 600 Ruby ensures uniform heat in gels because, firstly, the gels are completely immersed in the lower buffer for uniform heat transfer and, secondly, a standard magnetic stirrer circulates buffer around the vertically suspended heat exchanger to maintain homogeneous lower buffer temperature. The ergonomically designed SE 600 Ruby provides two built-in side handles, which facilitates carrying and handling.

ORDERING INFORMATION

Product	Quantity	Code Number
Dual Cooled Vertical Gel Units –		
– for 18 × 16 cm plates		
SE 600 Ruby Standard Dual Cooled Vertical Unit, Complete	1	80-6479-57
Includes: 3 sets of glass plates, four 16-cm clamp assemblies, 6 cams, dual gel casting stand with levelling base and level, buffer dam, Spacer-Mate alignment template, Wonder Wedge plate separation tool, two 15-well combs, and two sets of 1.5-mm thick spacers.		
– for 18 × 24 cm plates		
SE 660 Dual Cooled Vertical Unit, Basic.	1	80-6189-82
Includes: 3 sets of glass plates, four 16 cm and four 8 cm clamp assemblies, 6 cams, dual gel casting stand with leveling base and level, buffer dam, Spacer-Mate alignment template and WonderWedge plate separation tool. (Order 2 combs and 2 sets of 24 cm spacers separately.)		
Glass Plates –		
– 18 × 8 cm		
Glass plates, 18 × 8 cm	2	80-6186-59
Glass plates, 18 × 8 cm, low fluorescence	2	80-6475-77
Glass plate, club sandwich divider, notched	1	80-6186-78
– 18 × 16 cm		
Glass plates, 18 × 16 cm	2	80-6178-99
Low-fluorescence Glass Plates for SE600, 18 × 16 cm	2	80-6442-14
Glass plate club sandwich divider, notched	1	80-6179-18
– 18 × 24 cm		
Glass plates, 18 × 24 cm	2	80-6190-01
Glass plates, 18 × 24 cm, low fluorescence	2	80-6442-33
Glass plate, club sandwich divider, notched	1	80-6190-20

For pricing information, visit www.gelifesciences.com/orderonline

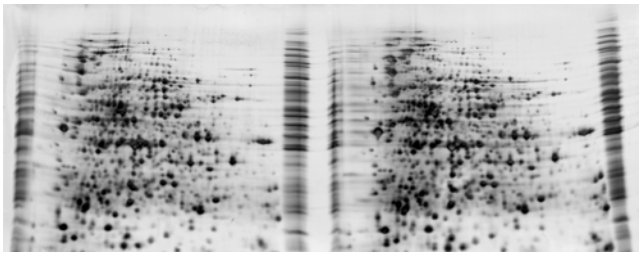
Related Products	Code Number	Refer To
EPS 601 Power Supply	18-1130-02	page 304
Rainbow Molecular Weight Markers *IMPROVED*		page 316
SE 100 Plate Washer and Storage Unit	80-6116-29	page 290
Electrophoresis Reagents		page 306
MultiTemp III Thermostatic Circulator		page 276
ImageQuant Imagers		page 384

Divider plates double gel capacity

Run up to four gels (up to 112 samples) in a single run. Divider plates convert single-gel sandwiches into two-gel club sandwiches, which seal and fit into the casting stand exactly like single gels.

Run up to 24–cm long gels with SE 660

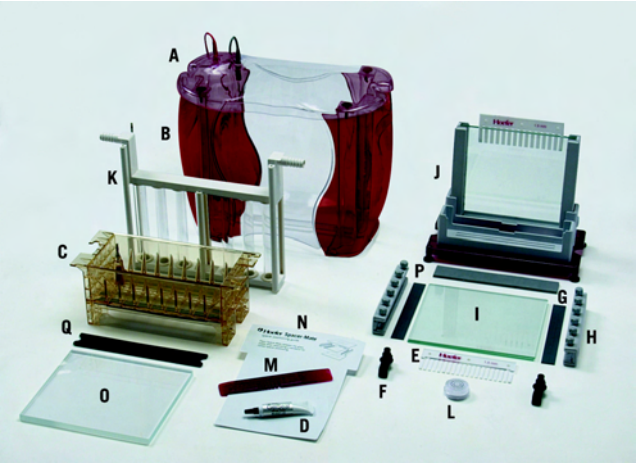
If gels longer than 16 cm are required, GE Healthcare offers the SE 660, which runs gels up to 24 cm. Except for gel length, the SE 660 has identical features to those of SE 600 Ruby.



Two 2-D maps can be prepared on one gel using SE 600 Ruby in conjunction with Immobiline DryStrip 7-cm gels. Request Application Note 80-6445-94 for details.

Standard-Format Vertical Units

SE 600 Ruby, SE 600, and SE 660 Components and Accessories



SE 600 Ruby Standard Vertical Unit Components

A. Lid assembly for SE 600 Ruby, 80-6476-34
Lid assembly for SE 660, 80-6176-52, is not shown
B. Lower buffer chamber for SE 600 Ruby, 80-6476-15
Lower buffer chamber for SE 660, 80-6191-15, is not shown
C. Upper buffer chamber, 80-6176-33
D. Gel seal, 80-6421-43
E. Comb, various
F. Cams, 80-6174-24
G. Spacer, various
H. Clamp 16 cm, 80-6173-29
I. Glass plate 18 × 16 cm, 80-6178-99
J. Casting stand, 80-6175-00
K. Heat exchanger, 80-6183-74
L. Level, 80-6194-19
M. Wonder Wedge separator, 80-6127-88
N. Spacer-Mate, 80-6181-65
O. Buffer dam, 80-6175-19
P. Laminated rubber gasket, 80-6174-62
Q. Slotted rubber gasket, 80-6174-43

ORDERING INFORMATION

Product	Quantity	Code Number
SE 600 Ruby, SE 600, and SE 660 Replacement Parts and Accessories		
Wonder Wedge plate separation tool	1	80-6127-88
Slotted silicone rubber gaskets for upper buffer chamber	2	80-6174-43
Laminated silicone rubber gaskets for casting stand	2	80-6174-62
Buffer dam	1	80-6175-19
Upper buffer chamber for SE600, SE600 Ruby, and SE 660	1	80-6176-33
Lid with power cables for SE 600 Ruby	1	80-6476-34
Lid with power cables for SE 660	1	80-6176-52
High-voltage safety lead set	1	80-6177-09
Lower buffer chamber for SE 600 Ruby	1	80-6476-15
Heat exchanger for SE 660	1	80-6183-74
Lower buffer chamber for SE 660	1	80-6191-15
Gel Seal	1	80-6421-43
Spirit level	1	80-6194-19
Clamps and Cams		
Clamp assemblies, 16 cm	2	80-6173-29
Clamp assemblies, 8 cm	2	80-6187-35
Clamp and cam kit, four 16-cm clamps and 8 black cams	1	80-6173-67
Cams, black, for new-style clamps with cam holes	4	80-6174-24

For pricing information, visit www.gelifesciences.com/orderonline

SE 600 / SE 400 Combs and Spacers

- ***All combs listed can be used in all SE 600 series and SE 400 units.***
- Preparative combs with single or dual reference lanes.
- Multichannel-pipette-compatible combs available.
- Spacers (16 cm) and most SE 600 accessories can be used with SE 400.

ORDERING INFORMATION

Comb Accessory		
Adjustable comb back (Convert any 25 mm-deep comb to 10 or 15 mm depth.)	1	80-6163-22

Length (cm)	Thickness (mm)	Width (cm)	Quantity	Code Number
Spacers for Vertical Gel Units				
8	0.75	2	2	**80-6187-73**
8	1.00	2	2	**80-6187-92**
8	1.50	2	2	**80-6188-11**
16	0.75	2	2	**80-6180-51**
16	1.00	1	2	**80-6179-94**
16	1.00	2	2	**80-6180-70**
16	1.50	1	2	**80-6180-13**
16	1.50	2	2	**80-6180-89**
24	0.75	2	2	**80-6190-58**
24	1.00	2	2	**80-6190-77**
24	1.50	2	2	**80-6190-96**

For pricing information, visit www.gelifesciences.com/orderonline

ORDERING INFORMATION

Wells					
No. Prep/ref	Thickness (mm)	Width (mm)	Vol. of sample per 1mm depth (µl)	Quantity	Code Number
Preparative Combs for SE 400 and SE 600 Series					
1/1*	0.75	121/6	**90/4**	1	**80-6164-17**
1/1*	1.00	121/6	**120/6**	1	**80-6164-36**
1/1*	1.50	121/6	**181/9**	1	**80-6164-55**
1/2*	0.75	113/6	**85/4**	1	**80-6163-41**
1/2*	1.00	113/6	**112/6**	1	**80-6163-60**
1/2*	1.50	113/6	**171/9**	1	**80-6163-79**
Teflon Combs for SE 400 and SE 600 Series					
10	0.75	8.3	**6.2**	1	**80-6159-99**
10	1.00	8.3	**8.3**	1	**80-6160-18**
10	1.50	8.3	**12.4**	1	**80-6160-37**
15	0.75	5.7	**4.3**	1	**80-6161-13**
15	1.00	5.7	**5.7**	1	**80-6161-32**
15	1.50	5.7	**8.6**	1	**80-6161-51**
20	0.75	4.1	**3.1**	1	**80-6161-70**
20	1.00	4.1	**4.1**	1	**80-6161-89**
20	1.50	4.1	**6.2**	1	**80-6162-08**
28†	0.75	2.7	**2.0**	1	**80-6162-27**
28†	1.00	2.7	**2.7**	1	**80-6162-46**
28†	1.50	2.7	**4.1**	1	**80-6162-65**

For pricing information, visit www.gelifesciences.com/orderonline

** These combs are 25 mm deep, adjustable to 10 or 15 mm.*
† Comb depth 15 mm; all others 25 mm.

SE 400 Vertical Unit

SE 400 Vertical Unit is a durable and economical unit for standard 16-cm long slab gels.

- ***Economical, safe vertical slab electrophoresis units with many of the conveniences of SE 600 series units.***
- Rugged injection-molded construction for easy assembly and durability in high-use labs.
- Built-in casting stand seals sandwiches leak-free without tape.
- Plates, clamps, spacers and combs are interchangeable with SE 600 series units.

SE 400 Vertical Units run one 16-cm gel or two gels with an accessory divider plate. Its low cost makes the SE 400 appropriate for labs requiring multiple units when temperature control is not crucial. The unit base is also a convenient casting stand for single gels. To cast multiple gels for one or more units, use the multiple gel casters.

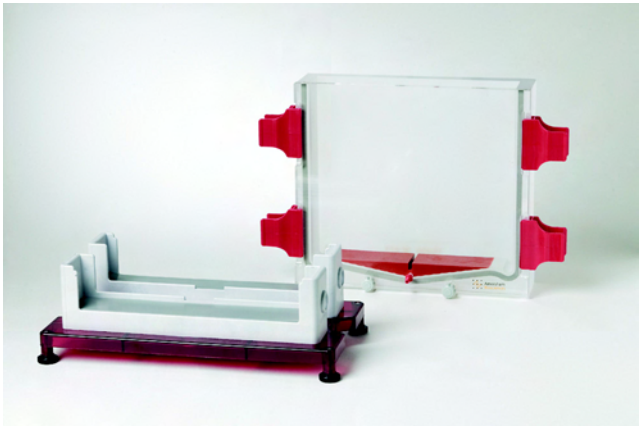
ORDERING INFORMATION

Product	Quantity	Code Number
Sturdier Vertical Slab Electrophoresis Units – for 18 × 16 cm plates		
SE 400 Vertical Unit, Complete	1	80-6155-24
Includes: One set of glass plates 18 × 16 cm, 2 clamp assemblies and 2 cams, 15-well comb and 2 spacers 1.5 mm thick.		
Accessories		
SE 600/SE 400 Gel Casters, see this page.		
Combs, spacers, glass plates and accessories for SE 400 (16 cm) unit are the same as those for the SE 600 series, see page 288.		
Replacement Parts		
Slotted silicone rubber gasket for upper buffer chamber	1	80-6155-43
Blank silicone rubber gasket for casting stand	1	80-6155-62
Lower buffer chamber/casting stand	1	80-6156-76
Upper buffer chamber	1	80-6156-95
Lid with electrodes for SE 400, 16 cm	1	80-6157-14
High-voltage safety lead set	1	80-6177-09

For pricing information, visit www.gelifesciences.com/orderonline

Related Products	Code Number	Refer To
EPS 601 Power Supply	18-1130-02	page 304
Rainbow Molecular Weight Markers *IMPROVED*		page 316
SE 100 Plate Washer and Storage Unit	80-6116-29	page 290
Electrophoresis Reagents		page 306

SE 600 / SE 400 Gel Casters



Cast multiple gels at once using Mini-Vertical Gel Casters.

SELECTION GUIDE – Gel Casters (SE 600/SE 400)

	Vertical unit	
No of gels	**SE 600 Ruby or SE 400**	**SE 660**
1 or 2	Dual Gel Caster (80-6175-00)	Dual Gel Caster (80-6175-00)
2-4	Gel Caster, 4 gels (80-6191-34)	–
2-10	Multiple Gel Caster (80-6182-79)	–

ORDERING INFORMATION

Product	Quantity	Code Number
Gel Casters – for 1 or 2 gels		
Dual Gel Caster 1 or 2 gels	1	80-6175-00
Includes: 2 blank gaskets. (One included with each SE 600 Ruby unit.)		
– for up to 4 gels, 18 × 16 cm plates		
Gel Caster, 4 gels	1	80-6191-34
Includes: 8 glass plates, 3 space-saver plates, 5 filler sheets, 100 sheets of wax paper, Spacer-Mate alignment template and filler plugs. (Order combs and spacers separately.)		
– for up to 10 gels, 18 × 16 cm plates		
Multiple Gel Caster, 10 gels	1	80-6182-79
Includes: 20 glass plates, space-saver plate, 5 filler sheets, 100 sheets of wax paper, and Spacer-Mate alignment template. (Order combs and spacers separately.)		
Casting Accessories and Replacement Parts		
Short red clamps, for gel casters	4	80-6148-02
Spacer-Mate template for aligning spacers	3	80-6181-65
Acrylic space saver block, 1.2 cm thick, 18 × 16 cm	1	80-6181-84
Polycarbonate filler sheets, 18 × 16 cm	5	80-6182-41
Wax paper, precut sheets, 18 × 16 cm	100	80-6182-60

For pricing information, visit www.gelifesciences.com/orderonline

Related Vertical Equipment

SG Gradient Makers

SG Gradient Makers are durable and accurate.

- ***Form gradients for acrylamide gel electrophoresis; liquid chromatography elution; and sucrose, cesium, and preparative zonal centrifugation.***
- Choose from five sizes between 15-ml and 500-ml total volume.
- Ring stand support rod included with the SG 15, SG 30, SG 50, and SG 100.

ORDERING INFORMATION

Product	Quantity	Code Number
SG 15 Gradient maker, 15 ml total volume	1	80-6197-61
SG 30 Gradient maker, 30 ml total volume	1	80-6197-80
SG 50 Gradient maker, 50 ml total volume	1	80-6197-99
SG 100 Gradient maker, 100 ml total volume	1	80-6196-09
SG 500 Gradient maker, 500 ml total volume	1	80-6198-18
Accessories and Replacement Parts		
White 3 mm outlet fitting for SG 15, SG 30, SG 50 and SG 100	1	80-6196-85
Valve, salt gradient push-pull, for SG 500	1	80-6198-56
Outlet fitting, red, 4 mm, for SG 500	4	80-6226-30

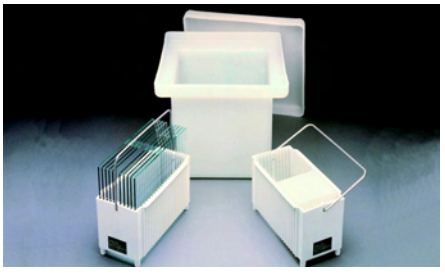
For pricing information, visit www.gelifesciences.com/orderonline

For gradients up to 2.2 l, use to DALT Gradient Maker (see page 277).

SELECTION GUIDE – Gradient Volumes for Gel Casters

Approximate Gradient Volumes					
Electrophoresis Unit	No. of Gels	Gel Caster	Gel Thickness 0.75 mm	1.0 mm	1.5 mm
SE 600, SE 400	10	Multiple Gel Caster 18 × 16 cm (80-6182-79)	222 ml	278 ml	390 ml
SE 600, SE 400	4	Gel Caster Kit, 4 Gels, 18 × 16 cm (80-6191-34)	63 ml	85 ml	130 ml
SE 260 miniVE	4	4-Gel Caster, 10 × 10.5 cm (80-6146-12)	29 ml	37 ml	54 ml

SE 100 Plate Washer and Storage Unit



SE 100 Plate Washer and Storage Unit simplifies glass plate handling.

- ***Soak, rinse and store multiple gel plates with convenient rack and covered tank.***
- Protects gel plates from chipping and cracking during handling and storage.
- Adjusts for plates from 8 × 10 cm to 18 × 16 cm.
- Holds ten 10–18-cm plates or twenty 8-cm plates.

SE 100 Plate Washer is an ideal accessory for vertical units with glass plates up to 18 × 16 cm.

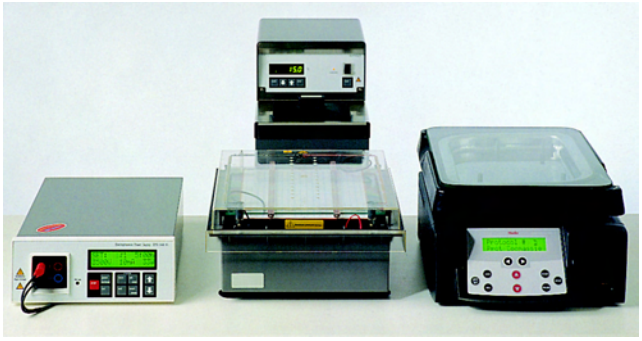
ORDERING INFORMATION

Product	Quantity	Code Number
SE 100 Plate Washer and Storage Unit	1	80-6116-29
Includes: 2 molded plate holders with handles, 2 long plate adapters, 2 dust covers and 1 polypropylene washing tank with lid.		
Long plate adapter for 10 cm and 12 cm long plates	2	80-6116-48
Molded plate holder with handle and dust cover	1	80-6116-67

For pricing information, visit www.gelifesciences.com/orderonline

DIGE approved

Multiphor II Electrophoresis System



Multiphor II Flatbed Electrophoresis System is designed for 1-D or 2-D electrophoresis. The system shown here is comprised of (from left to right) EPS 3501 XL Power Supply, Multiphor II Electrophoresis Unit (center, front), MultiTemp III Thermostatic Circulator (center, rear), and Processor Plus.

- ***Configure the system for 1-D or 2-D protein electrophoresis, or DNA fragment analysis.***
- Run up to 12 IPG strips (7–24 cm) simultaneously.
- Select from a wide range of precast gels or cast your own gels for unique applications.
- Allows cooling of ultra-thin gels efficiently and uniformly, through the ceramic cooling plate, for improved resolution and speed at high voltages.
- Adjustable electrodes allow use of different sized gels.

The modular design of Multiphor II gives it the flexibility to handle virtually any flatbed electrophoretic technique. It is particularly well-suited for ultra-thin gels (0.1–0.5 mm) on glass or plastic supports up to 20 × 26 cm. In addition to accommodating gels of different sizes, the electrodes make secure, uniform contact with various types of buffer strips, eliminating the need for large volumes of liquid buffers. Buffer strips can be positioned and held in place using Multiphor II Buffer Strip Positioner.

ExcelGel and Ampholine Precast Polyacrylamide Gels
These gels are available in formulations for denaturing and native protein separations, isoelectric focusing, and high-resolution DNA separations. For a complete listing of precast gels and buffer kits available for Multiphor II System, see page 294.

Multiphor II Electrophoresis Unit
The unit is supplied with a ceramic cooling plate, strip electrodes, and an electrode holder. The basic unit runs a variety of precast gels. For casting special application gels, a casting kit and accessories are required (see page 292). For performing first-dimension IEF separations, use Immobiline DryStrip Gels (see page 269), which require the use of Immobiline DryStrip Kit (see page 292). For performing semi-dry blotting, use NovaBlot Kit (see page 293).

ORDERING INFORMATION

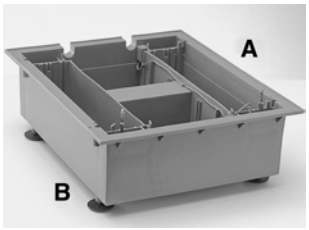
Product	Quantity	Code Number
Multiphor II	1	**18-1018-06**
Includes:		
Buffer tank	1	**18-1122-25**
Leveling feet	4	**18-1026-40**
Safety lid with high-voltage leads	1	**18-1122-26**
Cooling plate, ceramic, 210 × 270 mm	1	**18-1103-46**
Grommets	2	**80-1106-58**
Hose clamps	10	**18-1104-27**
Cooling tubing, 8 mm i.d., 12 mm o.d.	4 m	**80-1106-56**
Tubing connector set, female and male	4	**18-1104-26**
Electrode holder	1	**80-1106-55**
EPH/IEF electrode, anode	1	**18-1121-53**
EPH/IEF electrode, cathode	1	**18-1121-52**

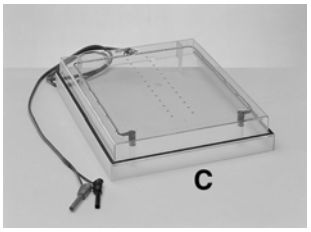
For pricing information, visit www.gelifesciences.com/orderonline

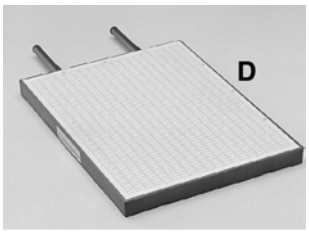
Related Products	Code Number	Refer To
EPS 3501 XL Power Supply	18-1130-05	page 305
MultiTemp III Thermostatic Circulator		page 276
Processor Plus		page 370

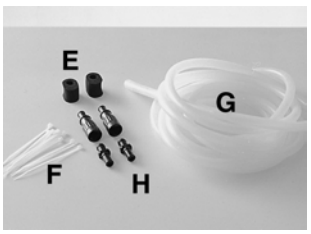
TECHNICAL SPECIFICATIONS

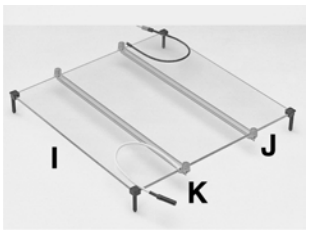
Safety certifications	CE 89/336/EEC (EMC directive); CE 73/23/EEC (LV directive); EN-61010-1 (IEC1010-1, UL3101-1, CSA22.2 1010-1)









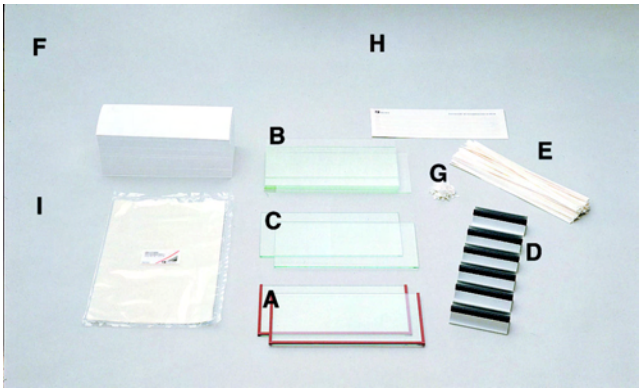


A. Buffer tank
B. Leveling feet
C. Safety lid with high-voltage leads
D. Cooling plate, ceramic, 210 × 270 mm
E. Grommets
F. Hose clamps
G. Cooling tubing, 8 mm i.d., 12 mm o.d.
H. Tubing connector female and male
I. Electrode holder
J. EPH/IEF electrode, anode
K. EPH/IEF electrode, cathode

Standard Flatbed Units

SELECTION GUIDE BY TECHNICAL OVERVIEW – Multiphor II Application Kits, Components and Accessories			
Technique	**Size**	**Accessory/Kit**	**Page**
Cast gradient gels	100 ml total volume	Gradient maker	293
Cast IEF acrylamide gels	258 × 124 × 0.5 mm	SDS and Native PAGE, IEF Casting Kit	this page
Position and hold ExcelGel Buffer Strips	24 × 11 cm and 24 × 18 cm	Multiphor II Buffer Strip Positioner	295
Rehydrate, run Immobiline DryStrip for IPG, 2-D	70, 110, 130, 180, or 240 mm strips	Immobiline DryStrip Kit and Reswelling Tray	this page
Semi-dry blotting	20 × 25 cm	NovaBlot Kit and Film Remover	293
For general information concerning electrophoresis of proteins, see Technical Appendix.			

SDS & Native PAGE, IEF Kit



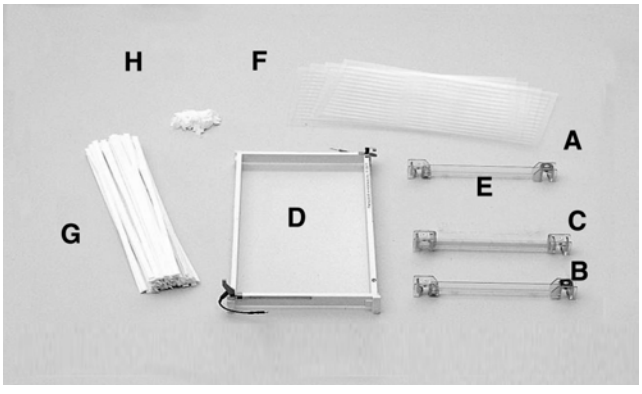
SDS and Native PAGE, IEF Casting Kit components:
A. Glass plates, 0.5 mm thick, U-frame
B. Glass plates, 1 mm thick
C. Glass plates, 3 mm thick
D. FlexiClamps
E. IEF electrode strips
F. EPH electrode wicks
G. IEF sample application pieces
H. IEF/SDS sample application strips
I. Cellophane sheets

ORDERING INFORMATION

Product	Quantity	Code Number
SDS and Native PAGE, IEF Casting Kit	1	**18-1102-45**
Includes:		
Glass plate, 125 × 260 × 0.5 mm, U-frame	2	**80-1106-89**
Glass plate, 260 × 125 × 1 mm	15	**80-1106-29**
Glass plate, 260 × 125 × 3 mm	2	**80-1106-99**
FlexiClamps	6	**18-1013-73**
IEF electrode strips	100	**18-1004-40**
EPH electrode wicks, paper 104 × 253 mm	500	**80-1129-52**
Sample application pieces	200	**80-1129-46**
IEF/SDS sample application strips, 52 samples, 5–20 µl	5	**18-1002-26**
Cellophane sheets, 210 × 320 mm	50	**80-1129-38**

For pricing information, visit www.gelifesciences.com/orderonline

Immobiline DryStrip Kit



- ***For use of Immobiline DryStrip gels with Multiphor II Electrophoresis System.***

Immobiline DryStrip Kit components:
A. Electrode, anode
B. Electrode, cathode
C. Sample cup bar
D. Tray and electrode holder
E. Sample cups
F. DryStrip aligners
G. IEF electrode strips
H. IEF sample application pieces

Please note that this kit can only be used with Multiphor II.

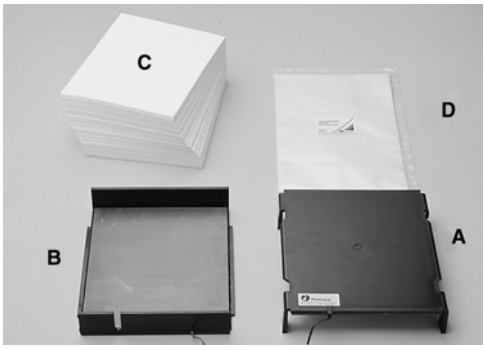
ORDERING INFORMATION

Product	Quantity	Code Number
Immobiline DryStrip Kit	1	**18-1004-30**
Includes:		
Electrode, anode	1	**18-1018-66**
Electrode, cathode	1	**18-1018-67**
Sample cup bar	1	**18-1004-33**
Tray and electrode holder	1	**18-1004-31**
Sample cups, Immobiline DryStrip Kit	60	**18-1004-35**
DryStrip aligners	4	**18-1004-34**
IEF electrode strips	100	**18-1004-40**
Sample application pieces	200	**80-1129-46**

For pricing information, visit www.gelifesciences.com/orderonline

Related Products	Code Number	Refer To
IPGbox ***NEW***	28-9334-65	page 271
IPGbox Kit ***NEW***	28-9334-92	page 271
Immobiline DryStrip Gels		page 269
Immobiline DryStrip Cover Fluid	17-1335-01	page 311

NovaBlot Kit



NovaBlot Kit components:
A. NovaBlot electrode, cathode
B. NovaBlot electrode, anode
C. Electrode paper NovaBlot, 200 × 250 mm
D. Cellophane sheets, 210 × 320 mm

ORDERING INFORMATION		
Product	**Quantity**	**Code Number**
NovaBlot Kit	1	18-1016-86
Includes:		
NovaBlot electrode, cathode	1	18-1019-86
NovaBlot electrode, anode	1	80-1257-87
Electrode paper NovaBlot, 200 × 250 mm	500	80-1106-19
Cellophane sheets, 210 × 320 mm	50	80-1129-38

For pricing information, visit www.gelifesciences.com/orderonline

General Accessories

ORDERING INFORMATION		
Product	**Quantity**	**Code Number**
General Accessories		
Film remover	1	18-1013-75
FlexiClamps	6	18-1013-73
Roller	1	80-1106-79
Cooling Plates and Accessories		
Cooling plate, ceramic, 210 × 270 mm	1	18-1103-46
Insulation for cooling tubing 14 mm i.d., 27 mm o.d.	1.8 m	80-1116-11
Glass Plates and Trays		
Glass plate, 84 × 94 × 1 mm	50	80-1106-69
Glass plate, 260 × 125 × 3 mm	2	80-1106-99
Glass plate, 260 × 125 × 1 mm	15	80-1106-29
Glass plate, 200 × 260 × 4 mm	2	18-1102-47
Glass plate, 125 × 260 × 0.5 mm, U-frame	2	80-1106-89
Glass plate, 125 × 260 × 1.0 mm, U-frame	2	80-1106-91
Glass plate, 125 × 260 × 2.0 mm, U-frame	2	80-1106-92
Glass plate, 125 × 260 × 0.5 mm, U-frame (Reswelling cassette)	1	80-1106-95
Glass plate, 125 × 240 mm, 0.5 mm spacer	3	80-1106-94
Glass plate, 200 × 260 × 0.5 mm, U-frame	2	80-1106-87
Glass plate, 200 × 260 × 1.0 mm, U-frame	2	80-1106-88
Glass plate, 125 × 270 × 6 mm (UltroMold)	1	80-1115-81
Glass plate, 125 × 490 × 6 mm (UltroMold)	1	80-1115-80

For pricing information, visit www.gelifesciences.com/orderonline

ORDERING INFORMATION		
Product	**Quantity**	**Code Number**
Preserving		
Cellophane sheets, 210 × 320 mm	50	80-1129-38
Gel Support		
GelBond PAGfilm 124 × 258 mm	50	80-1129-36
GelBond PAGfilm 203 × 260 mm	50	80-1129-37
GelBond film (agarose) 84 × 94 mm	50	80-1129-33
GelBond film (agarose) 124 × 258 mm	50	80-1129-32
Electrodes, Paper Electrode Strip, and Wicks		
IEF electrode strips	100	18-1004-40
EPH electrode, anode	1	18-1122-20
EPH electrode, cathode	1	18-1122-19
EPH electrode wicks, 82 × 130 mm	500	80-1129-53
EPH electrode wicks, paper 104 × 253 mm	500	80-1129-52
Electrode paper NovaBlot, 200 × 250 mm	500	80-1106-19
Sample Application		
SDS sample application strips, 26 samples, 40 µl	5	18-1002-74
IEF/SDS sample application strips, 52 samples, 5–20 µl	5	18-1002-26
Immobiline sample application strips, 52 samples, 5-20 µl	5	18-1002-76
Sample application pieces	200	80-1129-46
EPH/IEF sample application foil (agarose), 24 samples 2-4 µl	5	80-1129-47
Sample cups, Immobiline DryStrip Kit	60	18-1004-35

For pricing information, visit www.gelifesciences.com/orderonline

Standard Flatbed Units

Introduction to Multiphor II Precast Gels

Precast polyacrylamide gels make a wide range of electrophoretic techniques readily available with minimum preparation. The manufacturing quality and reproducibility of these gels translate into highly reliable and reproducible results with minimal training.

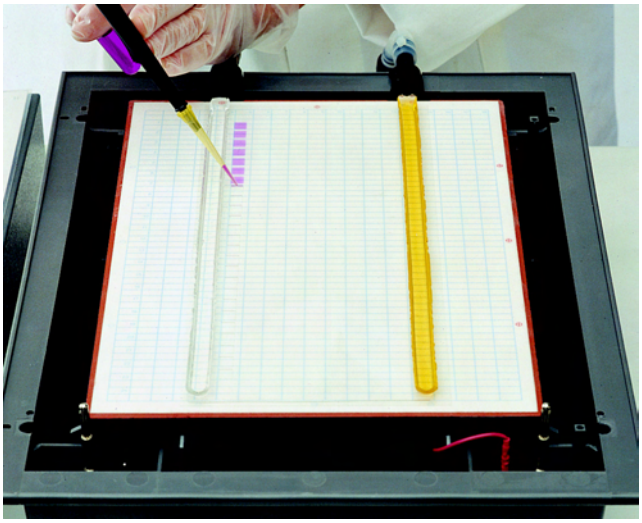
ExcelGel SDS and Ampholine PAGplate products are supplied fully hydrated and ready to use. CleanGel, Immobiline DryPlate, and DryStrip products are supplied dry and must be rehydrated in the appropriate buffer before use. Prepared swelling solutions are available for the most common procedures. All precast gel recipes are proprietary. However, buffer formulations for a variety of other applications are included in the instructions.

SELECTION GUIDE BY TECHNICAL OVERVIEW – Precast Gels and Buffer Kits for Multiphor II System

Application			Sample	Sample				
Protein	DNA	Product	Application	No./Gel	Vol (µl)	Buffer*	Quantity	Page
■	■	ExcelGel SDS Gradient, 8–18	strip	26	1–40	A	6	295
		ExcelGel SDS Homogeneous						
■	■	7.5	well	25	5–17	A	6	295
■	■	12.5	well	25	5–17	A	6	295
■	■	15	well	25	5–17	A	6	295
■	■	ExcelGel SDS Buffer Strips (anode and cathode)				C, D	6 pairs	295
		Ampholine PAGplate IEF						
■		pH 3.5–9.5†	strip	26–52	1–40		5	
■		pH 4.0–6.5†	strip	26–52	1–40		5	
■		pH 4.0–5.0†	strip	26–52	1–40		5	
■		CleanGel IEF	strip	26–52	1–40		5	296
		Immobiline DryPlate IEF						
■		pH 4.0–7.0	strip	26–52	1–40		3	296
■		pH 4.2–4.9	strip	26–52	1–40		3	296
■		pH 4.5–5.4	strip	26–52	1–40		3	296
■		pH 5.0–6.0	strip	26–52	1–40		3	296
■		pH 5.6–6.6	strip	26–52	1–40		3	296
■		Immobiline DryStrip, 2-D First Dimension IEF						269
■		IPG Buffer						269
■		ExcelGel SDS, 2-D Second Dimension						297

** Buffers:*
A: Tris/acetic acid pH 6.4
C: Tris/acetic acid pH 5.6
D: Tris/tricine pH 7.1
† Product to be discontinued by year-end 2008. For an alternative to Ampholine PAGplate IEF, please contact your local sales office.

ExcelGel for SDS-PAGE



Sample application is quick and accurate with preformed sample wells.

- ***Save time with ready to use, mechanically stable gels cast on plastic supports.***
- Apply samples quickly and easily using preformed sample wells.
- Avoid making running buffer by using precast buffer strips.

ORDERING INFORMATION

Product	Quantity	Code Number
ExcelGel SDS Gradient 8-18	6	80-1255-53
ExcelGel SDS Homogeneous 7.5	6	80-1260-01
ExcelGel SDS Homogeneous 12.5	6	80-1261-01
ExcelGel SDS Homogeneous 15	6	80-1262-01
ExcelGel SDS Buffer Strips (anode and cathode)	6 pairs	17-1342-01
Accessories		
Multiphor II Buffer Strip Positioner, complete	1	80-6442-90

For pricing information, visit www.gelifesciences.com/orderonline

ExcelGel precast gels for SDS-PAGE are available as homogeneous or gradient gels. The homogeneous gels have 25 preformed sample wells for sample volumes from 5–17 µl. The gradient gels use sample application strips (26 samples up to 40 µl, 52 samples up to 20 µl), paper pieces or sample droplets. All ExcelGel SDS Homogeneous and 8–18 gradient gels have a 33-mm stacking zone and a 77-mm separating zone.

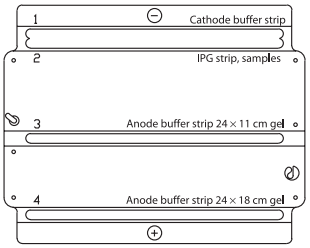
ExcelGel gradient gels are recommended for use with Immobiline DryStrip gels, see page 269. For information on ExcelGel for 2-D electrophoresis, see page 297.

TECHNICAL SPECIFICATIONS

	Gradient 8–18	Homogeneous 7.5	Homogeneous 12.5	Homogeneous 15
Separation range ($M_r \times 10^3$)	15–200	35–200	15–40	3–8
Gel description				
Dimensions (mm - W × L × T)	245 × 110 × 0.5	250 × 110 × 0.5	250 × 110 × 0.5	250 × 110 × 0.5
Stacking zone (% T/% C)	5/3	5/3	6/3	7.5/3
Separating zone (% T/% C)	8–18/3	7.5/3	12.5/2	15/3
Buffer*	A	A	A	B
Storage temperature (°C)	20–30	4–8	4–8	4–8

** Buffers:*
A: Tris/HAC, pH 6.4
B: As in A plus 30% ethylene glycol

Multiphor II Buffer Strip Positioner for ExcelGel



Multiphor II Buffer Strip Positioner is a frame with slots that sits on top of ExcelGel precast gel after the gel is placed on Multiphor II cooling plate. The slots in the positioner facilitate placement of the buffer strips for electrophoresis and hold the strips securely in place during the run.

ORDERING INFORMATION

Product	Quantity	Code Number
Multiphor II Buffer Strip Positioner, complete*	1	80-6442-90

For pricing information, visit www.gelifesciences.com/orderonline

** Multiphor II Buffer Strip Positioner is designed only for use with the current Multiphor II cooling plate, see Multiphor II Electrophoresis Unit, see page 291, image D. It cannot be used with earlier models of the cooling plate.*

Standard Flatbed Units

CleanGel for IEF

- ***Perform sensitive procedures using precast gels that are carefully washed and dried after casting to remove catalysts and unpolymerized material.***
- Customize IEF separations by reswelling in a suitable mixture of carrier ampholytes and other additives such as detergents or denaturants.
- Handle mechanically stable, plastic-backed gels with confidence.

CleanGel IEF precast gels are dried, "empty" gels, ready for reswelling in a carrier ampholyte solution of choice.

CleanGel IEF gels offer improved gel performance with faster and more stable gradients, fewer artifacts and easier zymogram assays.

Before use, CleanGel IEF gels are rehydrated using the convenient GelPool accessory. Swelling returns the gel to its original thickness of 0.5 mm.

ORDERING INFORMATION

Product	Quantity	Code Number
CleanGel IEF	5	**18-1035-32**
Accessories		
CleanGel IEF electrode strips	12	**18-1035-33**
GelPool	1	**18-1031-58**
Sample application pieces	200	**80-1129-46**
IEF/SDS sample application strips, 52 samples, 5–20 µl	5	**18-1002-26**
SDS sample application strips, 26 samples, 40 µl	5	**18-1002-74**

For pricing information, visit www.gelifesciences.com/orderonline

Related Products	Refer To
Pharmalyte	page 314

TECHNICAL SPECIFICATIONS

Gel dimensions after rehydration (W × L × T–mm)	250 × 110 × 0.5
Gel composition (% T/% C)	5/3
Storage temperature (°C)	-20

Immobiline DryPlate for IEF

- ***Obtain reproducible IEF separations with dry, precast gels containing immobilized pH gradients.***
- Choose from narrow (1 pH unit) and medium (3 pH units) pH ranges.
- Handle mechanically stable, plastic-backed gels with confidence.

Immobiline DryPlate precast gels contain preformed, immobilized, non-drifting pH gradients. The gels are rehydrated to a thickness of 0.5 mm in the reswelling cassette accessory before use.

Immobiline technology produces an absolutely stable pH gradient, allowing extremely high voltages and high resolution over narrow pH ranges, even for low mobility proteins that require long focusing times.

ORDERING INFORMATION

Product	Quantity	Code Number
Immobiline DryPlate pH 4.0-7.0	3	**80-1128-28**
Immobiline DryPlate pH 4.2-4.9	3	**80-1128-29**
Immobiline DryPlate pH 4.5-5.4	3	**80-1128-30**
Immobiline DryPlate pH 5.0-6.0	3	**80-1128-31**
Immobiline DryPlate pH 5.6-6.6	3	**80-1128-32**
Accessories		
Immobiline sample application strips, 52 samples, 5-20 µl	5	**18-1002-76**
Sample application pieces	200	**80-1129-46**

For pricing information, visit www.gelifesciences.com/orderonline

TECHNICAL SPECIFICATIONS

Gel dimensions after rehydration (mm - W × L × T)	245 × 110 × 0.5
Gel composition (% T/% C)	4/3
Storage temperature (°C)	-20

Multiphor II and ExcelGel System for second dimension

- ***Perform second-dimension separations using convenient precast gels and 7, 11, 18, or 24 cm IPG strips.***
- Choose from ExcelGel precast SDS-polyacrylamide gels available as 12.5% homogeneous and 12–14% gradient gels.
- Prepare multiple 2-D maps on a single gel using three 7-cm or two 11-cm IPG strips side-by-side.
- Configure Multiphor II with MultiTemp III Thermostatic Circulator and the programmable EPS 1001 Power Supply for reproducible running conditions.

The new Multiphor II Buffer Strip Positioner facilitates placement of ExcelGel Buffer Strips and holds the strips securely in place during the run.

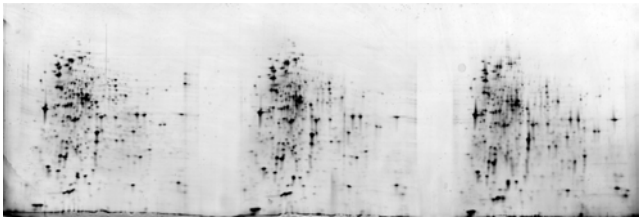
For additional information on Multiphor II, ExcelGel precast gels, and accessories, see page 294.

ORDERING INFORMATION

Product	Quantity	Code Number
Immobiline DryStrip length: 7, 11, and 18 cm		
ExcelGel 2-D Homogeneous 12.5	6	**17-6002-21**
ExcelGel Gradient XL 12-14	3	**17-1236-01**
ExcelGel SDS Buffer Strips (anode and cathode)	6 pairs	**17-1342-01**
Multiphor II	1	**18-1018-06**
Multiphor II Buffer Strip Positioner, complete	1	**80-6442-90**

For pricing information, visit www.gelifesciences.com/orderonline

Related Products	Refer To
MultiTemp III Thermostatic Circulator	page 276
EPS 1001 Power Supply	page 304



Three 2-D maps can be prepared on one gel using Multiphor II in conjunction with Immobiline DryStrip 7 cm gels and ExcelGel 2-D Homogeneous 12.5. Request Application Note 80-6443-47 for details.

TECHNICAL SPECIFICATIONS – ExcelGel Precast Gels

	2-D Homogeneous 12.5 (17-6002-21)	Gradient XL 12-14 (17-1236-01)	Buffer Strips (anode and cathode) (17-1342-01)
Separation range ($M_r \times 10^3$)	10–120	12–116	
Dimensions (mm; W × L × T)	250 × 110 × 0.5	245 × 180 × 0.5	245 × 4.5
Stacking zone (mm, %T/%C)	33, 6/3	40, 5/3	
Separating zone (mm, %T/%C)	77, 12.5/2	140, 12–14/3	
Buffer*	A	B	C, D
Storage temperature (°C)	4–8	4–30	4–8

** Buffers:*
A: Tris-acetate, pH 6.4
B: Tris-acetate, pH 6.6
C: Anode buffer: Tris-acetate, pH 6.6
D: Cathode buffer: Tris-tricine, pH 7.1

Automated Flatbed Units

Supported by Labcrew

PhastSystem

PhastSystem provides automated protein and nucleic acid electrophoresis with ready-to-use gels, buffer strips, stain kits and proven protocols.

- ***Automatically separate and stain proteins under controlled power and temperature conditions.***
- Program and store nine separation protocols of nine steps each, and nine staining protocols of 20 steps each.
- Regulate gel temperature through Peltier-controlled support bed.
- Assure reproducibility with quality-tested precast gels, buffer strips, and staining kits.

PhastSystem consists of a Separation-Control unit for system control and electrophoresis, and a Development Unit for gel staining. The optional PhastTransfer Kit quickly converts the system into a semi-dry blotting unit. Electrophoresis is performed on a thermostatic plate capable of maintaining temperatures accurately from 0°C to 70°C. Multistep programming capability allows gels to be prerun, loaded, and run automatically. Controlled parameters include temperature, voltage, current, power, and volt-hours.

TECHNICAL SPECIFICATIONS

Separation and Control Unit	
Capacity	1 or 2 gels
Keyboard	31 keys with audible tone
Display	40-digit alphanumeric liquid crystal
LEDs	4 LEDs for status information
Programmable parameters	Voltage, current, power, temperature, duration in volt-hours, sample application and an extra alarm for 9 programs of 9 steps
Voltage range	10–2000 V
Current range	0.1–50.0 mA
Power range	0.1–7.0 W
Volt-hour integrator range	1–9999 Vh/step
Separation temperature range	0°C to 70°C
Alarm	Audible alarm at end of separation
Dimensions (W × D × H)	46 × 30 × 14 cm
Weight	6.2 kg
Battery back-up	Lithium battery
Safety features	Short-circuit protection; protected against power disturbances and static discharges; lid power interlock and alarm
Safety certifications	CE 89/336/EEC (EMC directive); CE 73/23/EEC (LV directive); EN-61010-1 (IEC1010-1, UL3101-1, CSA22.2 1010-1).

ORDERING INFORMATION

Product	Quantity	Code Number
PhastSystem Separation-Control and Development Units 120 VAC	1	18-1018-23
PhastSystem Separation-Control and Development Units 220 VAC	1	18-1018-24
Separation-Control Unit 120 VAC	1	18-1200-00
Separation-Control Unit 220 VAC	1	18-1200-10
Accessories		
PhastGel Sample Applicators 12 × 0.3 µl	50	18-1614-01
PhastGel Sample Applicators 8 × 0.5 µl	50	18-1617-01
PhastGel Sample Applicators 8 × 1 µl	50	18-1618-01
PhastGel Sample Applicators, 6 × 4 µl	50	18-0012-29
Sample well stamp	1	18-0097-01
PhastTransfer Kit	1	18-1001-23

For pricing information, visit www.gelifesciences.com/orderonline

Related Products	Refer To
PhastGel	page 299

The stainless steel development unit is capable of processing two gels simultaneously at temperatures from ambient to 50°C. Up to nine different reagents can be used in a single processing program.

The combination of PhastSystem with PhastGels and buffer strips provides an integrated system of unsurpassed quality, flexibility, and reproducibility with a minimum of manual involvement. A substantial list of applications testifies to the utility of PhastSystem.

Visit www.gelifesciences.com to access application notes and a reference list on the use of PhastSystem.

TECHNICAL SPECIFICATIONS

Development Unit	
Capacity	1 or 2 gels
Volume	80 ml solution
Number of ports	9, plus 1 for waste
Agitation	Rotation
Development	Solutions automatically pumped
Programmable parameters	Inlet port, outlet port, duration, temperature and an alarm for 9 programs of 20 steps
Development temp. range	Ambient to 50°C
Dimensions (W × D × H)	30 × 30 × 14 cm
Weight	4.8 kg
Safety certifications	CE 89/336/EEC (EMC directive); CE 73/23/EEC (LV directive); EN-61010-1 (IEC1010-1, UL3101-1, CSA22.2 1010-1)
PhastTransfer	
Transfer technique	Semi-dry electrophoretic blotting
Capacity	1 or 2 gels
Transfer time	10–30 min
Buffer required	5 ml/gel
Electrode cassette	PBTP (thermoplastic polyester containing glass fiber)
Electrodes	Graphite
Chemical resistance	Aqueous solvents and diluted alcohols in the pH range 2–11
Dimensions (W × D × H)	20 × 15 × 3 cm
Gel backing remover	17 × 9 × 6 cm

PhastGel

- ***Select from homogeneous and gradient polyacrylamide gels.***
- Separate proteins and peptides on denaturing, native, and isoelectric focusing gels.
- Save time and improve reproducibility with precast gels, buffer strips, and staining kits.
- Achieve detection sensitivity comparable to that of radioisotopes with ready-to-use silver staining kits.

PhastGel media are polyacrylamide gels, 43 × 50 × 0.45 mm (W × L × T), on a polyester film backing. With a wide variety of gel formulations available, the small format has proven flexibility, documented by dozens of application notes and hundreds of published references. A dedicated PhastGel Kit is available for detection of oligoclonal IgG in unconcentrated cerebrospinal fluid, CSF Analysis Kit includes gels and reagents for 40 analyses.

PhastGel Blue R

PhastGel Blue R tablets are a readily soluble, pre-measured means of preparing Coomassie Blue R-350 solutions. PhastGel Blue R-350 is more sensitive than the commercially available R-150 and R-250 forms and can detect most proteins at 50–100 ng/band. One tablet makes 400 ml of a 0.1% staining solution.

Silver staining kit, protein

For PlusOne Silver Staining Kit, Protein (17-1150-01), see page 368. This product can be used for rapid, sensitive, reproducible staining of proteins in polyacrylamide gels including PhastGel media using the PhastSystem Development Unit.

Note: the PlusOne Silver Staining Kit, Protein replaces the original PhastGel Protein Silver Staining Kit, 17-0617-01.

PhastGel DNA Silver Staining Kit

PhastGel DNA Silver Staining Kit supplies the reagents required to detect as little as 20 pg DNA per band using PhastSystem Development Unit. After only 30 minutes developing time, the stained gel can be dried for photography or storage. Dried silver-stained DNA gels also constitute an archive from which bands can be cut out and amplified.

Reference

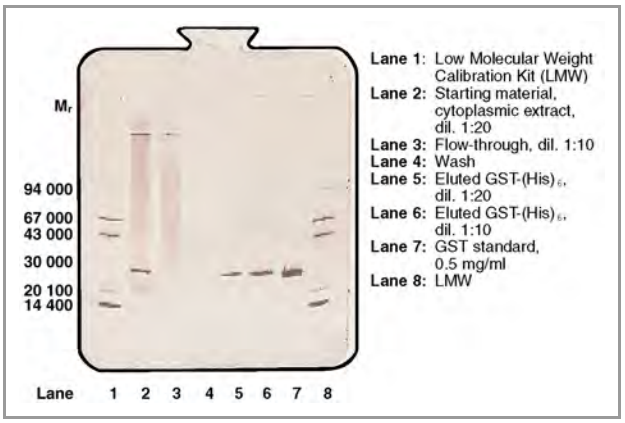
Heukeshoven, J. and Dernick, R. *Electrophoresis* **6**, 103 (1985).

ORDERING INFORMATION

Product	Quantity	Code Number
PhastGel Buffer Strips – DNA	10 pairs	17-1599-01
PhastGel Buffer Strips – SDS	10 pairs	17-0516-01
PhastGel Buffer Strips – Native	10 pairs	17-0517-01
PhastGel Gradient – 4-15	10	17-0678-01
PhastGel Gradient – 10-15	10	17-0540-01
PhastGel Gradient – 8-25	10	17-0542-01
PhastGel Homogeneous – 7.5	10	17-0622-01
PhastGel Homogeneous – 12.5	10	17-0623-01
PhastGel Homogeneous – 20	10	17-0624-01
PhastGel Homogeneous – High density	10	17-0679-01
PhastGel IEF – 3-9	10	17-0543-01
PhastGel IEF – 4-6.5	10	17-0544-01
PhastGel IEF – 5-8	10	17-0545-01
PhastGel Dry IEF	10	17-0677-01
PhastGel cassette	1	18-1001-01
Application Kits		
CSF Analysis Kit	1	18-1039-14
PhastGel Staining Kits		
PlusOne Coomassie Tablets, PhastGel Blue R-350	40 tablets	17-0518-01
PlusOne Silver Staining Kit, Protein	1	17-1150-01
PhastGel DNA Silver Staining Kit	1	17-1596-01
PhastGel Sample Applicators		
PhastGel Sample Applicators 12 × 0.3 µl	50	18-1614-01
PhastGel Sample Applicators 8 × 0.5 µl	50	18-1617-01
PhastGel Sample Applicators 8 × 1 µl	50	18-1618-01
PhastGel Sample Applicators, 6 × 4 µl	50	18-0012-29
Sample well stamp	1	18-0097-01

For pricing information, visit www.gelifesciences.com/orderonline

PhastGel media, buffer strips and Protein Silver Staining Kit should be stored at 4°C to 8°C. DNA Silver Staining Kit should be stored at room temperature.


M,
94 000
67 000
43 000
30 000
20 100
14 400
Lane 1 2 3 4 5 6 7 8
Lane 1: Low Molecular Weight Calibration Kit (LMW)
Lane 2: Starting material, cytoplasmic extract, dil. 1:20
Lane 3: Flow-through, dil. 1:10
Lane 4: Wash
Lane 5: Eluted GST-(His)6, dil. 1:20
Lane 6: Eluted GST-(His)6, dil. 1:10
Lane 7: GST standard, 0.5 mg/ml
Lane 8: LMW

SDS-PAGE of histidine-tagged glutathione S-transferase purified from a cytoplasmic extract using HisTrap Kit and FPLC. Analysis of sample fractions performed on PhastSystem using PhastGel 10-15 and PlusOne Silver Staining Kit, Protein.

Automated Flatbed Units

PhastGel (continued)

TECHNICAL SPECIFICATIONS

PhastGel

	Gradient 4–15	Gradient 10–15	Gradient 8–25	Homogeneous 7.5	Homogeneous 12.5	Homogeneous 20	Homogeneous High Density
Separation range							
Native ($M_r \times 10^3$)	70–700	80–440	50–300	230–700	80–230	50–100	20–60
SDS ($M_r \times 10^3$)	30–200	15–150	6–150	40–200	20–45	3–25	2–15
Gel description							
Stacking zone (13 mm) Composition (% T/% C)	4.5/3	6/3	6/3	5/3	6/3	7.5/2	7.5/2
Separating zone (32 mm) Composition (% T/% C)	5–15/2	10–15/2	8–25/2	7.5/2	12.5/2	20/2	20/2
Buffer*	A	A	A	A	A	A	B

** Buffers:*
A: 112 mM acetate, 112 mM Tris, pH 6.4
B: 112 mM acetate, 112 mM Tris, 30% ethylene glycol, pH 6.4
Store at 4°C to 8°C.

TECHNICAL SPECIFICATIONS

PhastGel Buffer Strips

Dimensions (W × L × H)	10 × 41 × 6 mm
Gel material	3% agarose IEF
Buffer	
SDS (17-0516-01)	0.20 M tricine, 0.20 M Tris, 0.55% SDS, pH 8.1
Native (17-0517-01)	0.88 M L-alanine, 0.25 M Tris, pH 8.8

TECHNICAL SPECIFICATIONS

PhastGel for IEF

	PhastGel IEF* 3–9	PhastGel IEF* 4–6.5	PhastGel IEF* 5–8	PhastGel Dry IEF
Separation range (pI)	3–9	4–6.5	5–8	Optional†
Gel composition (% T/% C)	5/3	5/3	5/3	5/3

PhastGel IEF gels should be stored at 4–8°C.
PhastGel Dry IEF should be stored at -20 to -80°C.
† Reswell in choice of carrier ampholyte composition, using PhastGel cassette.
** All PhastGel IEF gels contain Pharmalyte carrier ampholytes.*

Blotting Products

For main product entries, see Chapter 9.

GenePhor DNA Separation System and Precast Gels

For main product entries, page 238.

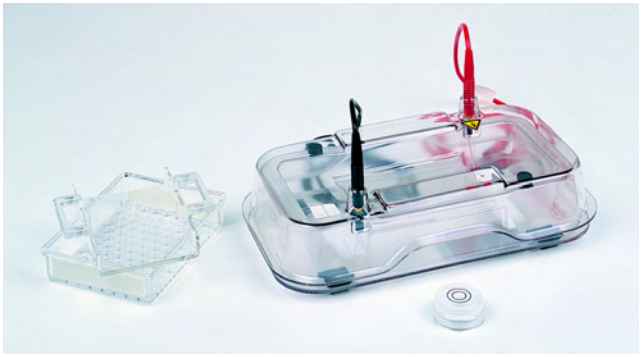
Introduction to Nucleic Acid Electrophoresis Units

SELECTION GUIDE BY TECHNICAL OVERVIEW – Nucleic Acid Electrophoresis Units

Model	Key Application Features	Maximum Samples/Gel	Separation Distance (cm) at Maximum Samples	Maximum Separation Distance (cm)	Gel Size (W × L, cm)	Buffer Volume (ml)
Mini-Format						
HE 33	Coolant-filled base for fast, large-sample-number runs	32	4	10	7 × 10	150–250
HE 99X	Basic, large-format unit for large sample numbers					1000–1200
Gel Tray I		60	4	10	15 × 10	
Gel Tray II		60	6	15	15 × 15	
Gel Tray III		60	8	20	15 × 20	

For general information concerning electrophoresis of nucleic acids, see Technical Appendix
20-well combs offer 9-mm spacing for multichannel pipette loading

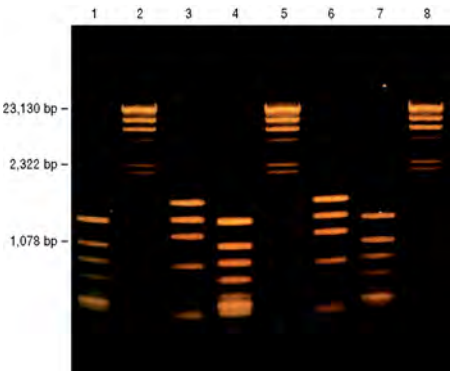
HE 33 Mini Submarine Unit



HE 33 Mini Submarine Unit gives enhanced passive cooling for faster runs.

- ***Coolant-insulated buffer chamber runs 7 × 10 cm agarose gels in less than 20 min.***
- Convenient, leak-proof casting trays mean fast gel casting without tape.
- UV-transparent gel tray offers convenient gel handling and viewing.
- Combs allow up to 32 samples per run.

HE 33 Mini Submarine Unit has an enhanced passive cooling system, allowing you to run gels at high voltages for unparalleled speed and resolution in a mini-gel submarine unit. The novel molded base is designed to be filled with a common coolant such as 50% ethylene glycol so that it readily maintains short-term cooling capacity after chilling in a freezer. This allows for highly efficient heat exchange.



Separation of DNA size markers in HE 33 Submarine Unit. Lanes 1, 4, 7: ϕX-174 RF DNA-HindII digest; lanes 2, 5, 8: lambda DNA-HindIII digest; lanes 3, 6: ϕX-174 RF DNA-HaeIII digest. Markers were separated for 30 min at 200 V in a 1% agarose gel.

ORDERING INFORMATION

Product	Quantity	Code Number
HE 33 Mini Submarine Unit, Basic.	1	80-6052-64
Includes: Gel running tray, gel casting tray and bubble level. (Order comb and comb back separately.)		
HE 33 Mini Submarine Unit, Complete.	1	80-6052-45
Includes: Basic unit, 1.5 mm thick 8-well comb and comb back.		
Accessories and Replacement Parts		
Buffer chamber assembly	1	80-6050-17
Comb back with 2 screws for HE 33 combs	1	80-6050-36
Lid with power cables	1	80-6052-83
Filling plug, top	4	80-6412-31
Filling plug, bottom	1	80-6053-02
Gel running tray, UVT, 7 × 10 cm	1	80-6053-40
Casting tray, 7 × 10 cm	1	80-6053-59
Gel casting kit with casting tray and running tray, 7 × 10 cm	1	80-6053-78
Foam gasket	2	80-6053-97
Electrode replacement kit	1	80-6053-21

	Wells			
No.	Thickness (mm)	Width (mm)	Quantity	Code Number
HE 33 Combs*				
1/2†	1.0	44/6	1	80-6051-88
1/2†	1.5	44/6	1	80-6052-07
8	1.0	6.5	1	80-6051-50
8	1.5	6.5	1	80-6051-69
12	1.0	3.9	1	80-6050-74
12	1.5	3.9	1	80-6050-93
16	1.0	2.6	1	80-6051-12
16	1.5	2.6	1	80-6051-31

For pricing information, visit www.gelifesciences.com/orderonline

* *Without back. Order 80-6050-36 comb back separately.*
† *Preparative/reference wells.*

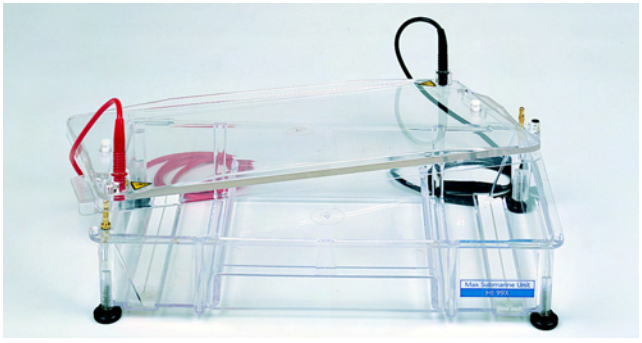
Related Products	Code Number	Refer To
EPS 301 Power Supply	18-1130-01	page 304
Agaroses		page 308
DNA Molecular Weight Markers		page 320

TECHNICAL SPECIFICATIONS – Nucleic Acid Electrophoresis Units

Safety Certifications	CE 73/23/EEC (LV directive); EN-61010-1 (IEC1010-1, UL3101-1, CSA22.2 1010-1)

Standard Format Submarine Units / Pulsed Field Gel Electrophoresis

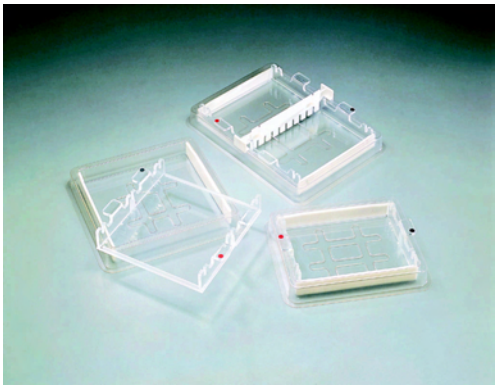
HE 99X Max Submarine Unit



HE 99X Max Submarine Unit fir multiple gel lengths and durable service.

- ***Versatile submarine unit is ideal for any molecular biology lab.***
- Run as many as 60 samples at once.
- Casting kits require no tape or dams.
- Multichannel-pipettor-compatible combs available.

HE 99X Max Submarine Unit offers the best value for general applications use in a standard-sized format.



Gel casting kits for HE 99X require no tape or dams.

ORDERING INFORMATION

Product	Quantity	Code Number
HE 99X Max Submarine Unit, Basic	1	80-6061-38
(Order gel casting kit, comb, and comb back separately.)		
HE 99X Max Submarine Unit, Complete.	1	80-6061-57
Includes: Basic unit, 15 × 20 cm gel casting kit, one 1.5 mm thick 15-well comb and comb back.		
Accessories and Replacement Parts		
Comb back for HE 99X combs with 2 screws	1	80-6054-35
Foam sealing gaskets	4	80-6061-19
HE 99X Gel Casting Kits		
Kit, 15 × 10 cm	1	80-6060-62
Kit, 15 × 15 cm	1	80-6060-81
Kit, 15 × 20 cm	1	80-6061-00

Wells				
No.	Thickness (mm)	Width (mm)	Quantity	Code Number
HE 99X Combs*				
10	1.5	9.7	1	80-6055-68
10	3.0	9.7	1	80-6055-87
15	1.0	7.1	1	80-6056-06
15	1.5	7.1	1	80-6056-25
15	3.0	7.1	1	80-6056-44
20	1.0	4.7	1	80-6056-63
20	1.5	4.7	1	80-6056-82
20	3.0	4.7	1	80-6057-01
30	1.0	3.0	1	80-6057-20
1/2†	1.5	113/10	1	80-6057-58
1/2†	3.0	113/10	1	80-6057-77
Multichannel-Pipette-Compatible Combs for HE 99X				
14	1.0	6.0	1	80-6460-38
14	1.5	6.0	1	80-6460-57

For pricing information, visit www.gelifesciences.com/orderonline

** Without back. Order 80-6054-35 comb back separately.*
† Preparative/reference wells.

Related Products	Code Number	Refer To
EPS 301 Power Supply	18-1130-01	page 304
Agaroses		page 308
DNA Molecular Weight Markers		page 320
ImageQuant Imagers		page 384

TECHNICAL SPECIFICATIONS – Nucleic Acid Electrophoresis Units

Safety Certifications	CE 73/23/EEC (LV directive); EN-61010-1 (IEC1010-1, UL3101-1, CSA22.2 1010-1)

Accessories for Gene Navigator Pulsed Field System

Supported by Labcrew

ORDERING INFORMATION

Hexagonal Electrode Kit	1 kit	18-1019-20
Includes: Hexagonal electrode, gel support tray (15 × 15 cm), gel casting frame (15 × 15 cm), 1 mm thick 12- or 23-well comb, 2 mm thick 12- or 23-well comb, 2 mm thick preparative comb making 1 or 2 wells.		
Point Electrode Kit	1 kit	18-1019-23
Includes: 6 cathode electrodes, 2 anode electrodes, gel support tray (20 × 20 cm), gel casting tray (20 × 20 cm), 2 mm thick 22-well comb.		

EPS Power Supplies

EPS Power Supplies cover the wide range of electrophoresis and blotting applications. Designed for performance, EPS Power Supplies can be relied on for safety and reproducibility.

All EPS power supplies offer:
- Easy to read digital display.
- Timed or continuous runs, with end-of-run alarm, if desired.
- Automatic parameter limit crossover to prevent overheating and protect experiments and equipment.
- Automatic recovery after power failure.
- Membrane keypads for easy programming.
- Two pairs of power outlets for duplicate parallel runs.

General guidelines for using power supplies:
- The constant current mode is recommended for blotting to prevent overheating.
- The constant voltage mode is recommended for other applications, such as nucleic acid submarine and mini-vertical gel electrophoresis.
- When connecting two electrophoresis units to the same power supply, twice as much current is required at the same voltage.
- To maintain a constant temperature without using a thermostatic circulator, use the constant power mode.

TECHNICAL SPECIFICATIONS	
Safety certifications	All EPS Power Supplies have the following safety certifications: CE 89/336/EEC (EMC directive); CE 73/23/EEC (LV directive); EN-61010-1

EPS Power supplies are the perfect tools for electrophoresis and blotting applications.

SELECTION GUIDE BY TECHNICAL OVERVIEW – Power Supplies by Performance

	EPS 301	EPS 601	EPS 1001	EPS 3501 XL	EPS 2A200
Output range					
Voltage (V)	5–300	6–600	5–1000	35–3500 5 V increments	0–200
Current (mA)	10–400	1–400	1–400	1–400	0–2000
Power (W)	80 max	1–100	1–100	1–200	1–200
Timer, run end	1 min–24 h, continuous	1 min–500 h, continuous; 1 Vh–500 kVh	1 min–500 h, continuous; 1 Vh–500 kVh	1 min–500 h, continuous; 1 Vh–500 kVh; 1 mAhr–25 Ahr	0–999 min, continuous
Output connector type*	4 mm	4 mm	2 mm	2 mm	4 mm
Programs stored		3 protocols, 1 phase	3 protocols, 1 phase	9 protocols, 9 phases each	3 protocols, 1 phase
AC power requirement (mains)	100–120 V/ 220–240 V; 50/60 Hz; 120 W	100–120 V/ 220–240 V; 50/60 Hz; 140 W	100–120 V/ 220–240 V; 50/60 Hz; 140 W	100–120 V/ 220–240 V; 50/60 Hz, 260 W	90—132/ 180—265 VAC; 47–63 Hz;325 W
Safety features	overload/short circuit protection, floating output	overload/short circuit protection, ground leakage detection, no-load detection	overload/short circuit protection, ground leakage detection, no-load detection	overload/short circuit protection, ground leakage detection, no-load detection	overload / short circuit detection, no-load detection
Dimensions (mm), weight (kg)	250 × 215 × 95, 3.0	250 × 310 × 95, 3.8	250 × 310 × 95, 3.8	250 × 310 × 95, 3.8	110 × 270 × 220, 2.2
Page	**304**	**304**	**304**	**305**	**305**

** Power Supply Adapters, see page 305*

EPS Power Supplies (continued)

SELECTION GUIDE BY APPLICATION – Power Supplies

Application	EPS 301	EPS 601	EPS 1001	EPS 3501 XL	EPS 2A200	Electrophoresis Equipment
Ultrathin, flatbed PAGE (SDS or Native)		❖†	●	●		Multiphor II
Standard SDS-PAGE	●	●	●*	●*	❖	SE 400/600 Series (16-cm long)
Mini SDS-PAGE	●	●	●*	●*	●	miniVE, SE 260
High-volume SDS-PAGE*		●			❖	Ettan DALT*six*
Submarine	●	●	●*	●*	●	HE Series
DNA sequencing				●		
Western blotting (mini-tank)	●	●	●*	●*	●	TE 22
Western blotting (standard tank)	●	●	●*	●*	●	TE 62
Western blotting (semi-dry)	●	●	●*	●*	●	TE 70 Series
SSCP/DNA fragment analysis	❖†	●	●	●	❖†	GenePhor‡; Multiphor II
Isoelectric focusing — carrier ampholyte				●		Multiphor II

* *Adapter 18-1129-59 required (for connecting 4-mm high-voltage leads on gel units to power supplies with 2-mm output jacks)*

† *Adapter 18-1129-58 required (for connecting 2-mm high-voltage leads on gel units to power supplies with 4-mm output jacks)*

‡ *See Chapter 6*

● *Recommended*

● *Possible but not recommended: may exceed safety limits of the instrument*

❖ *Has limited voltage range for some applications*

● *Has limited current range for some applications*

EPS 301

- ***300 V, 400 mA, 80 W maximum.***
- Constant voltage or constant current modes.
- Single-unit increments in settings and read-outs for precision and reproducibility.
- Suitable for submarine, mini-vertical, and standard vertical gel electrophoresis as well as semidry and mini-tank blotting applications.

ORDERING INFORMATION

Product	Quantity	Code Number
EPS 301 Power Supply	1	**18-1130-01**

For pricing information, visit www.gelifesciences.com/orderonline

Related Products	Code Number	Refer To
miniVE Vertical Electrophoresis System		page 283
Nucleic Acid Electrophoresis		page 300
ImageQuant Imagers		page 384

EPS 601

- ***600 V, 400 mA, 100 W maximum.***
- Constant voltage, constant current, and constant power modes.
- Single-unit increments in settings and read-outs for precision and reproducibility.
- Stores and recalls three protocols.
- Suitable for general applications, including mini- and standard-sized vertical gels and many blotting applications.

ORDERING INFORMATION

Product	Quantity	Code Number
EPS 601 Power Supply	1	**18-1130-02**

For pricing information, visit www.gelifesciences.com/orderonline

Related Products	Refer To
SE 600 Ruby and SE 660 Dual Cooled Vertical Units	page 287
Nucleic Acid Electrophoresis	page 300

EPS 1001

- ***1000 V, 400 mA, 100 W maximum.***
- Constant voltage, constant current, and constant power modes.
- Single-unit increments in settings and read-outs for precision and reproducibility.
- Stores and recalls three protocols.
- Outstanding choice for non-IEF ultrathin flatbed gels on Multiphor II systems.

ORDERING INFORMATION

Product	Quantity	Code Number
EPS 1001 Power Supply	1	**18-1130-03**

For pricing information, visit www.gelifesciences.com/orderonline

EPS 3501 XL

- ***3500 V, 400 mA, 200 W maximum.***
- Constant voltage, constant current, constant power, and linear voltage ramp modes.
- Linear voltage ramp mode brings proteins to focused equilibrium in IPG strips quickly without danger of overheating.
- Volt-hour and milliampere-hour modes compensate for variations in gel thickness, sample ionic strength, and temperature.
- Stores and recalls up to nine protocols, each with nine phases and phase-end alarms.
- Program automatic shut-off or phase end based on time, volt-hour/milliampere-hour.
- Current rating of up to 400 mA to handle both electrophoresis and basic blotting applications.
- Current resolution of 1 µA for Immobiline DryStrip and other IPG separations.

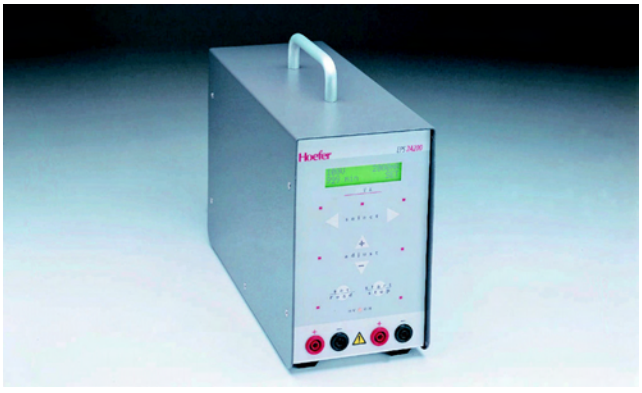
ORDERING INFORMATION		
Product	**Quantity**	**Code Number**
EPS 3501 XL Power Supply	1	18-1130-05

For pricing information, visit www.gelifesciences.com/orderonline

Related Products	Code Number	Refer To
Multiphor II	18-1018-06	page 291

EPS 2A200

Supported by Labcrew



EPS 2A200 Power Supply – high current for all types of electrophoretic blotting.

ORDERING INFORMATION		
Product	**Quantity**	**Code Number**
EPS 2A200 Power Supply	1	80-6406-99

For pricing information, visit www.gelifesciences.com/orderonline

- ***200 V, 2000 mA, 200 W maximum.***
- Constant voltage, constant current, or constant power modes.
- Single-unit increments in settings and read-outs for precision and reproducibility.
- Print log of run parameters via RS232 port.
- Designed for high current applications such as tank blotting.
- Stores and recalls three protocols.

Related Products	Refer To
Protein Blotting	Chapter 9

Power Supply Adapters

Instrument Leads \ Power Supply Jacks	X: 4-mm sheathed output jacks: found on all current Amersham Biosciences power supplies rated at voltages less than 1000 V.	Y: 2-mm high-voltage output jack: found on all current Amersham Biosciences power supplies rated at voltages of 1000 V and more.
A: Sheathed 4-mm male plug: installed on all current Amersham Biosciences electrophoresis units rated at voltages less than 1000 V.	no adapter necessary	18-1129-59
B: Sheathed 2-mm male plug: included with all current Amersham Biosciences electrophoresis units rated 1000 V and more.	18-1129-58	no adapter necessary

ORDERING INFORMATION		
Product	**Quantity**	**Code Number**
Adapter set (2 mm/4 mm) for use with 2 mm HV leads to 4 mm power supply output jacks	1	18-1129-58
Adapter set (4 mm/2 mm) for use with 4 mm HV leads to 2 mm power supply output jacks	1	18-1129-59

For pricing information, visit www.gelifesciences.com/orderonline

- ***Choose adapters for connecting 4 mm or 2 mm leads to 2 mm or 4 mm output jacks, respectively.***
- Use Adapter Set (4 mm/2 mm) for connecting sheathed 4 mm male plug instrument leads to 2 mm high-voltage output jacks.
- Use Adapter Set (2 mm/4 mm) for connecting sheathed 2 mm male plug instrument leads to 4 mm sheathed output jacks.

To use GE Healthcare electrophoresis units rated less than 1000 V with GE Healthcare power supplies rated at more than 1000 V, use Adapter Set (4 mm/2 mm).

To use GE Healthcare electrophoresis units rated 1000 V and higher with GE Healthcare power supplies rated at less than 1000 V, use Adapter Set (2 mm/4 mm).

Electrophoresis Reagents

- ***Optimized quality for each electrophoresis technique.***
- Strict specification control.
- Batch testing to ensure reproducibility.

High Quality Electrophoresis Chemicals—a complete range of chemicals for electrophoresis.

SELECTION GUIDE – Standards and Reagents

Product	Use	Page
PlusOne Gel Casting Chemicals		
Acrylamide IEF	IEF, PAGE, Sequencing	308
Acrylamide IEF 40 % Solution	IEF, PAGE	308
ReadySol IEF 40% T, 3% C	IEF	308
Acrylamide PAGE	PAGE	308
Acrylamide PAGE 40% Solution	PAGE	308
ReadySol DNA PAGE 40% T, 5% C	PAGE, Sequencing	308
N,N'-Methylenebisacrylamide	IEF, PAGE, Sequencing	311
N,N'-Methylenebisacrylamide 2% solution	IEF, PAGE, Sequencing	311
Ammonium Persulfate	IEF, PAGE, Sequencing	309
TEMED	IEF, PAGE, Sequencing	312
PlusOne Buffers		
Boric Acid	PAGE, Sequencing	309
DeStreak Reagents	IEF rehydration solution	307
EDTA, Disodium Salt	PAGE, Sequencing	310
Glycine	PAGE	311
PlusOne Additives and Sample Treatment		
Formamide	PAGE, Sequencing	310
Mercaptoethanol	IEF, PAGE	311
Glycerol, 87%	IEF, PAGE, Sequencing	310
PlusOne Detergents		
Tween 20	IEF, PAGE	312
PlusOne Stains and Staining Kits		
Coomassie Blue R Tablets	PAGE, IEF	369
DNA Silver Staining Kit	PAGE	335
Silver Staining Kit, Protein	IEF, PAGE	368

Related Products	Refer To
ImageQuant Imagers	page 384

SELECTION GUIDE – Standards and Reagents (continued)

Product	Use	Page
PlusOne Glass Plate Treatment		
Repel-Silane ES	IEF, PAGE, Sequencing	312
Bind-Silane	IEF, PAGE, Sequencing	309
Other PlusOne Reagents		
Immobiline DryStrip Cover Fluid	2-D Immobiline DryStrip	311
Amberlite IRN-150L	Deionizing Solutions	308
Agaroses	DNA/RNA, IEF	308
Carrier Ampholytes and Immobiline for IEF		
Pharmalyte Carrier Ampholytes	IEF	314
Immobiline II System	IEF	314
Protein Molecular Weight and pI Markers		
Protein MW Markers	PAGE	315
Rainbow MW Markers	PAGE	316
ECL Western Blotting MW Markers	PAGE	318
Protein Molecular Weight Standards	PAGE	318
[^{14}C] Protein MW Markers	PAGE	319
pI Markers	IEF	319
Carbamylyte Calibration Kit	IEF, 2-D IEF	319
DNA Molecular Weight Markers		
50 Base-Pair Ladder	Agarose, PAGE	320
100 Base-Pair Ladder	Agarose, PAGE	321
KiloBase DNA Marker	Agarose	321
Restriction Digests	Agarose	321
PlusOne Reagents		
Urea	IEF, PAGE, Sequencing	190
CHAPS	IEF, PAGE	190
Triton X-100	IEF, PAGE	190
Tris	PAGE, Sequencing	190
Sodium Dodecylsulfate	PAGE	190
Dithiothreitol	IEF, PAGE	190
Bromophenol Blue	IEF, PAGE, Sequencing	190
Iodoacetamide	IEF, PAGE	311
Thiourea	IEF, 2–D PAGE	312

DeStreak Rehydration Solution

DIGE approved

DeStreak Rehydration Solution contains DeStreak Reagent, which reduces nonspecific oxidation of proteins and streaking in 2-D gels and improves reproducibility significantly.

- ***Improves reproducibility and quality of 2–D gels by preventing streaking.***
- Eliminates extra spots caused by nonspecific oxidation of proteins.
- Stabilizes proteins throughout entire 2–D runs, ensuring simplified, well–resolved protein patterns.
- Ideal for both analytical and preparative gels.

The appearance of streaks that distort 2–D electrophoresis maps is a common problem, occurring most frequently when running gels that contain regions greater than pH 7.0. Increased sample load, increased length of the IPG strip, or using a narrower pH gradient worsen the problem. Extra spots on 2–D gels, caused by nonspecific oxidation of proteins, is another difficulty encountered when running gels containing basic regions. Both streaking and nonspecific oxidation result in poorly resolved protein patterns and reduced reproducibility between electrophoresis runs.

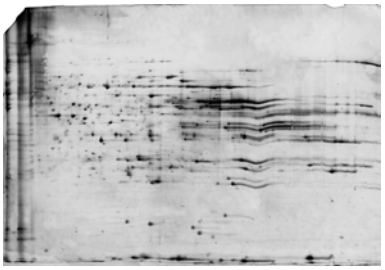
DeStreak Rehydration Solution effectively eliminates nonspecific oxidation by maintaining protein thiol groups in a single oxidation state, irrespective of sample load, pH range, or run length. Protein patterns are stabilized in IPG strips of any length and pH gradient ensuring the same stable and reproducible pattern in every analysis. The effectiveness of DeStreak Rehydration Solution is maintained at the high sample loads and long run times required for preparative gel electrophoresis.

ORDERING INFORMATION

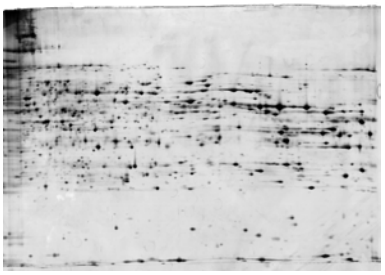
Product	Quantity	Code Number
DeStreak Rehydration Solution	5 x 3 ml	**17-6003-19**
DeStreak Reagent	1 ml	**17-6003-18**

For pricing information, visit www.gelifesciences.com/orderonline

Related Products	Refer To
Introduction to Trap Kits for Protein Sample Preparation	page 190
Immobiline DryStrip Gels	page 269



Mouse liver proteins (80 µg) run on a 24 cm-long Immobiline DryStrip gel, pH 6–9. The IPG strip was rehydrated in 1% IPG Buffer pH 6–11, 8 M urea, 0.5% CHAPS, 10 mM DTT without DeStreak Rehydration Solution. Poor resolution and horizontal streaking are evident on the resulting 2–D gel.



Same sample, sample load, and Immobiline DryStrip gel but with rehydration of the IPG strip in DeStreak Rehydration Solution with 1% IPG Buffer. Horizontal streaking is reduced, improving the overall quality of the resulting 2–D pattern.

DeStreak Rehydration Solution contains optimized concentrations of urea, thiourea, CHAPS, and DeStreak Reagent. The solution is ready for use after addition of the appropriate IPG Buffer. DeStreak Reagent is also available separately in a 1-ml pack size.

PlusOne Acrylamide

PlusOne Acrylamide PAGE contains extremely low concentrations of impurities that can interfere with the polymerization reaction. It is especially suitable for SDS and native PAGE techniques.

PlusOne Acrylamide IEF is outstanding for use in isoelectric focusing and DNA sequencing. In addition to the absence of polymerization interfering impurities, Acrylamide IEF is essentially free of charged acrylamide derivatives (< 20 ppm) for very stable pH gradients.

PlusOne Acrylamide is available as a powder, a solution, and premixed solutions (ReadySol).

Powder
Dry powder is the most stable form of acrylamide with a shelf life of more than three years.

TECHNICAL SPECIFICATIONS		
Acrylamide	**IEF**	**PAGE**
M_r	71.08	71.08
Minimum assay	> 99.9%	
Acrylic acid	< 0.002%	< 0.05%

ORDERING INFORMATION		
Product	**Quantity**	**Code Number**
PlusOne Acrylamide PAGE	250 g	17-1302-01
PlusOne Acrylamide PAGE	1 kg	17-1302-02
Acrylamide PAGE 40% Solution	1 l	17-1303-01
PlusOne ReadySol DNA/PAGE 40% T, 5% C	1 l	17-1308-01
PlusOne Acrylamide IEF	250 g	17-1300-01
PlusOne Acrylamide IEF 40% Solution	1 l	17-1301-01
PlusOne ReadySol IEF 40% T, 3% C	1 l	17-1310-01

For pricing information, visit www.gelifesciences.com/orderonline

Solution
Solutions of acrylamide are convenient, virtually eliminating the risk of acrylamide dust in the air.

ReadySol
ReadySol, a solution of acrylamide and bisacrylamide, is convenient and fast with minimal preparation and handling. ReadySol ensures a reproducible solution composition.

Agaroses

DNA/RNA Techniques
Agarose with low electroendosmosis (EEO) is recommended for most DNA/RNA applications. If separated nucleic acids are to be used as substrates for enzymes, e.g., ligase and restriction endonucleases, a special highly purified agarose such as Agarose NA should be used.

For preparative work, an agarose with low gelling temperature should be used. Agarose Prep has both low melting and gelling points.

IEF Techniques
Agarose IEF is suitable for isoelectric focusing of large molecules and is the gel of choice for many IEF applications and immunochemical detection methods.

ORDERING INFORMATION		
Product	**Quantity**	**Code Number**
Agarose IEF	10 g	17-0468-01
Agarose NA	100 g	17-0554-02
Agarose NA	1 kg	17-0554-03
Agarose Prep	50 g	80-1130-07

For pricing information, visit www.gelifesciences.com/orderonline

TECHNICAL SPECIFICATIONS				
Agarose Type	**Electroendosmosis $-m_r$**	**Gel Strength (Kobe) 1.5%**	**Gelling Temp. °C**	**Melting Temp. °C**
Agarose IEF	0.00	> 1000	40–43	-
Agarose NA	0.10	2400	34–37	-
Agarose Prep	< 0.10	> 200*	< 30	65
** 1% agarose*				

PlusOne Amberlite IRN-150L

Amberlite IRN-150L is a homogeneous mixture of strong cationic and strong anionic resins. It is used to remove trace ionic impurities from nonionic chemicals such as urea.

ORDERING INFORMATION		
Product	**Quantity**	**Code Number**
PlusOne Amberlite IRN-150L	500 g	17-1326-01

For pricing information, visit www.gelifesciences.com/orderonline
Store at room temperature

PlusOne Ammonium Persulfate

DIGE approved

Ammonium persulfate is the initiator of choice for the polymerization of acrylamide. The high quality of PlusOne Ammonium Persulfate supports efficient polymerization at concentrations as low as 1 mM.

TECHNICAL SPECIFICATIONS	
M_r	228.20
Minimum assay	> 98%

ORDERING INFORMATION		
Product	**Quantity**	**Code Number**
PlusOne Ammonium Persulfate	25 g	17-1311-01

For pricing information, visit www.gelifesciences.com/orderonline

Store dark and dry at room temperature

PlusOne Bind-Silane

DIGE approved

Bind-Silane (γ-methacryloxypropyltrimethoxysilane) is used to covalently attach polyacrylamide gels to a glass surface. The gel stays firmly attached to the glass during staining and drying procedures.

ORDERING INFORMATION		
Product	**Quantity**	**Code Number**
PlusOne Bind-Silane	25 ml	17-1330-01

For pricing information, visit www.gelifesciences.com/orderonline

Store dark and dry at room temperature

PlusOne Boric Acid

PlusOne Boric Acid.

Boric acid is for the preparation of TBE buffer, the most frequently used buffer for DNA/RNA electrophoresis.

ORDERING INFORMATION		
Product	**Quantity**	**Code Number**
PlusOne Boric Acid	500 g	17-1322-01

For pricing information, visit www.gelifesciences.com/orderonline

Store at room temperature

TECHNICAL SPECIFICATIONS	
M_r	61.83
Minimum assay	99.8%

Bromophenol Blue

Bromphenol Blue is an electrophorisis tracking dye.

ORDERING INFORMATION		
Product	**Quantity**	**Code Number**
Bromophenol Blue	10 g	17-1329-01

For pricing information, visit www.gelifesciences.com/orderonline

CHAPS

DIGE approved

A nonionic or zwitterionic detergent is included in the sample solution to ensure complete sample solubilization and to prevent aggregation through hydrophobic interactions. CHAPS is a zwitterionic detergent commonly used in IEF.

ORDERING INFORMATION		
Product	**Quantity**	**Code Number**
CHAPS	1 g	17-1314-01

For pricing information, visit www.gelifesciences.com/orderonline

Dithiothreitol (DTT)

DIGE approved

Reducing agents are frequently included in the sample solution to break any disulfide bonds present and to maintain all proteins in their fully reduced state. The most commonly used reductant is dithiothreitol (DTT).

ORDERING INFORMATION		
Product	**Quantity**	**Code Number**
Dithiothreitol	1 g	**17-1318-01**

For pricing information, visit www.gelifesciences.com/orderonline

PlusOne EDTA, disodium salt

PlusOne EDTA, disodium salt.

EDTA (ethylenediaminetetraacetic acid, disodium salt, dihydrate), a cation chelator, is used in DNA electrophoresis buffers to inhibit metal-requiring nucleases.

ORDERING INFORMATION		
Product	**Quantity**	**Code Number**
PlusOne EDTA, disodium salt	100 g	**17-1324-01**

For pricing information, visit www.gelifesciences.com/orderonline

Store at room temperature

TECHNICAL SPECIFICATIONS	
M_r	372.24
Minimum assay	99.5%

PlusOne Formamide

A mild denaturant for nucleic acids similar to urea, formamide is used in denaturing nucleic acid electrophoresis and hybridization.

TECHNICAL SPECIFICATIONS	
M_r	45.04
Minimum assay	99%
DNases (exo- and endonucleases)	Not detected
RNases	Not detected

ORDERING INFORMATION		
Product	**Quantity**	**Code Number**
PlusOne Formamide	250 ml	**17-1320-01**

For pricing information, visit www.gelifesciences.com/orderonline

Store dry at room temperature

PlusOne Glycerol

DIGE approved

Glycerol is a stabilizing medium for casting polyacrylamide gradients. In IEF, the pH gradient can be stabilized by introducing 10–15% glycerol. It also stabilizes polyacrylamide gels for preservation.

TECHNICAL SPECIFICATIONS	
M_r	92.09
Minimum assay	86% to 88%
Density at 20°C	1.2 g/ml

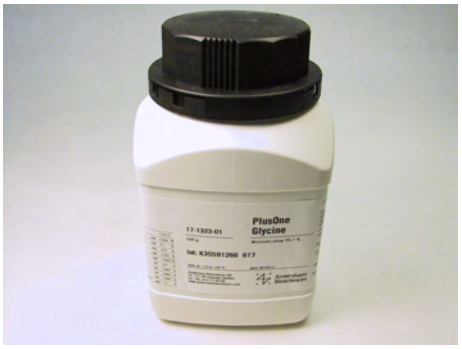
ORDERING INFORMATION		
Product	**Quantity**	**Code Number**
PlusOne Glycerol, 87%	1 l	**17-1325-01**

For pricing information, visit www.gelifesciences.com/orderonline

Store at room temperature

PlusOne Glycine

DIGE approved



PlusOne Glycine.

Glycine is frequently used as a component of electrophoresis buffers, especially in the Laemmli discontinuous buffer system for SDS-PAGE.

ORDERING INFORMATION		
Product	**Quantity**	**Code Number**
PlusOne Glycine	500 g	17-1323-01

For pricing information, visit www.gelifesciences.com/orderonline

Store at room temperature

TECHNICAL SPECIFICATIONS	
M_r	75.07
Minimum assay	99.7%

Immobiline DryStrip Cover Fluid

DIGE approved

This specially purified fraction of mineral oil protects Immobiline DryStrip gels from drying and from the atmosphere during the first dimension of 2-D electrophoresis. The fluid is also suitable as a contact between cooling plate and gel backing film in horizontal electrophoresis.

ORDERING INFORMATION		
Product	**Quantity**	**Code Number**
Immobiline DryStrip Cover Fluid	1 l	17-1335-01

For pricing information, visit www.gelifesciences.com/orderonline

Store at room temperature

Iodoacetamide

DIGE approved

Ultrapure, proteomic-grade iodoacetamide is used for efficient alkylation of thiols while minimizing oxidation of the competing thiol pairs in protein samples.

ORDERING INFORMATION		
Product	**Quantity**	**Code Number**
Iodoacetamide	25 g	RPN6302

For pricing information, visit www.gelifesciences.com/orderonline

PlusOne Mercaptoethanol

2-Mercaptoethanol is used to reduce disulfide bonds for electrophoretic analysis of protein. At low concentrations, mercaptoethanol prevents the oxidation of proteins.

TECHNICAL SPECIFICATIONS	
M_r	78.13
Minimum assay	99%
Weight per ml at 20°C	1.12 g

ORDERING INFORMATION		
Product	**Quantity**	**Code Number**
PlusOne Mercaptoethanol	25 ml	17-1317-01

For pricing information, visit www.gelifesciences.com/orderonline

Store dry at room temperature

PlusOne N,N'-Methylenebisacrylamide

PlusOne N,N'-Methylenebisacrylamide is a general cross-linker used with acrylamide for PAGE techniques. It is available as a dry powder and a premixed solution.

TECHNICAL SPECIFICATIONS	
M_r	154.17
Minimum assay	> 99.9%
Acrylic acid (HPLC)	< 0.02%

ORDERING INFORMATION		
Product	**Quantity**	**Code Number**
PlusOne N,N'-Methylene-bisacrylamide	25 g	17-1304-01
PlusOne N,N'-Methylene-bisacrylamide	100 g	17-1304-02
PlusOne N,N'-Methylene-bisacrylamide 2% Solution	1 l	17-1306-01

For pricing information, visit www.gelifesciences.com/orderonline

PlusOne Repel-Silane ES

Repel-Silane ES is a 2% solution of dimethyldichlorosilane dissolved in octamethylcyclooctasilane, a low toxicity, environmentally safe solvent. It is used to inhibit sticking of polyacrylamide gels, agarose gels, and nucleic acids to glass surfaces.

ORDERING INFORMATION		
Product	**Quantity**	**Code Number**
PlusOne Repel-Silane ES	500 ml	17-1332-01

For pricing information, visit www.gelifesciences.com/orderonline

Store dark and dry at room temperature

Sodium Dodecylsulfate (SDS)

DIGE approved

SDS is an ionic detergent used to solubilize proteins. The PlusOne SDS reagent is carefully controlled for carbon chain length and overall quality.

ORDERING INFORMATION		
Product	**Quantity**	**Code Number**
Sodium Dodecyl Sulfate	100 g	17-1313-01

For pricing information, visit www.gelifesciences.com/orderonline

PlusOne TEMED

DIGE approved

TEMED is a catalyst for the polymerization of acrylamide when used with ammonium persulfate.

TECHNICAL SPECIFICATIONS	
M_r	116.21
Minimum assay	99%

ORDERING INFORMATION		
Product	**Quantity**	**Code Number**
PlusOne TEMED	25 ml	17-1312-01

For pricing information, visit www.gelifesciences.com/orderonline

Store well sealed, dry and dark at room temperature

Thiourea

DIGE approved

Thiourea is a chaotrope that is used together with urea in the IPG strip rehydration solution to solubilize and denature proteins, unfolding them to expose internal ionizable amino acids. Thiourea increases the solubility of membrane proteins.

ORDERING INFORMATION		
Product	**Quantity**	**Code Number**
Thiourea	100 g	RPN6301

For pricing information, visit www.gelifesciences.com/orderonline

Tris

DIGE approved

Qualified for 2-D electrophoresis, Tris (tris[hydroxymethyl] aminoethane) is suitable for preparing electrophoresis buffer in the pH range 7.2 to 9.0.

ORDERING INFORMATION		
Product	**Quantity**	**Code Number**
Tris	500 g	17-1321-01

For pricing information, visit www.gelifesciences.com/orderonline

Triton X-100

DIGE approved

A nonionic or zwitterionic detergent is included in the sample solution to ensure complete sample solubilization and to prevent aggregation through hydrophobic interactions. Triton X-100 is a nonionic detergent commonly used in IEF.

ORDERING INFORMATION		
Product	**Quantity**	**Code Number**
Triton X-100	500 ml	17-1315-01

For pricing information, visit www.gelifesciences.com/orderonline

PlusOne Tween 20

Tween 20 (polyoxyethylene(20)sorbitan monolaurate) is a mild detergent for solubilization of native proteins. It can be used in polyacrylamide and agarose gels for electrophoresis and IEF. Density of Tween 20 at 20°C is 1.1 g/ml.

ORDERING INFORMATION		
Product	**Quantity**	**Code Number**
PlusOne Tween 20	500 ml	17-1316-01

For pricing information, visit www.gelifesciences.com/orderonline

Store dark at room temperature

Urea

DIGE approved

Urea solubilizes and unfolds most proteins to their fully random conformation, with all ionizable groups exposed to solution. Urea is included in the 2-D sample solution at a concentration of at least 8 M.

ORDERING INFORMATION		
Product	**Quantity**	**Code Number**
Urea	500 g	**17-1319-01**

For pricing information, visit www.gelifesciences.com/orderonline

Ettan Chemicals

- ***Convenient and reliable, designed specifically for use with Ettan Spot Handling Workstation.***
- Guaranteed high and uniform reagent quality.
- Formats adapted for batch processing.

With the large number of stages during the processing of 2-D gels, from the gel to protein identification, the quality and uniformity of the reagents used is paramount. At each stage of spot picking, digestion, spotting, and MALDI-ToF analysis, the quality of the chemicals used is essential to produce an accurate and reliable result.

Ettan Chemicals have been designed to minimize the variations, within runs and between runs, that can be caused by the processing chemicals. The chemicals are supplied in convenient batch aliquots to minimize oxidation and contamination of stock bottles.

Trifluoroacetic Acid (TFA)
TFA has two functions when used with Ettan Spot Handling Workstation. The pH reduction caused by TFA assists in the extraction of the digest from the gel plugs in the Digester. TFA is also used to dilute the ACH-Cinnamic Acid mixture where it functions as an acidifier to maintain protonation in the matrix.

The purity of Ettan Chemicals TFA is optimized with regard to the demands of MALDI-ToF analysis.

The contents of each bottle are diluted before use.

ORDERING INFORMATION		
Product	**Quantity**	**Code Number**
Trifluoroacetic Acid, 50 ml	1	**17-6002-76**
Trypsin, sequencing grade, 10 × 250 µg	1	**17-6002-75**

For pricing information, visit www.gelifesciences.com/orderonline

TECHNICAL SPECIFICATIONS	
Trypsin	M_r = 24000
Specific activity	5000 units/mg protein
Trifluoracetic acid	M_r = 115.03

Trypsin, sequencing grade
Trypsin specifically hydrolyzes peptide bonds at the carboxylic sites of lysine and arginine residues. A high purity trypsin preparation is essential to achieve good protein identification results.

Trypsin, sequencing grade is purified from porcine pancreas, which has been proven to be superior for protein sequencing compared to trypsin derived from other sources. The reagent has been further treated with TPCK (L-1-chloro-3-[4-tosyl-amido]-4-phenyl-2-butanone), which irreversibly inhibits chymotrypsin and many other serine and cysteine proteases such as bromelain, ficin, and papain. A further purification by affinity chromatography removes pseudotrypsin and results in a highly active and stable preparation.

Trypsin, sequencing grade is modified by reductive methylation to decrease autolysis of the enzyme and increase stability.

The contents of each vial are reconstituted with 6.5 ml of 20 mM ammonium bicarbonate and then diluted with a further 6 ml of ammonium bicarbonate before use.

Immobiline for IEF and Carrier Ampholytes

Carrier Ampholytes and Immobiline for IEF

- ***Linear, stable pH gradients with even conductivity across the gradient.***
- High buffering capacity.
- Reproducible pI determination.
- Broad and narrow pH ranges available.

The Immobiline System is recommended when extremely high resolution and time-stable linear pH gradients are required (e.g., 2-D electrophoresis). Pharmalyte Carrier Ampholytes are excellent for both analytical and preparative isoelectric focusing.

Immobiline II Reagents

Immobiline II Reagents are buffering acrylamide derivatives with different dissociation constants. When different pK values of Immobiline are mixed in appropriate proportions in a gradient maker, together with acrylamide, bisacrylamide, TEMED, and ammonium persulfate, a pH gradient is formed that is covalently attached to the polyacrylamide gel.

Immobiline II reagents can form any narrow or wide pH gradient in the 3.8–10 range without gradient drift and conductivity gaps. Because the pH gradient is completely immobilized and stable, reproducible linear gradients with a slope as low as 0.01 pH units/cm can separate proteins with pI differences of 0.001 pH units.

ORDERING INFORMATION

Product	Quantity	Code Number
Immobiline II pK 3.6	10 ml	80-1255-70
Immobiline II pK 4.6	10 ml	80-1255-71
Immobiline II pK 6.2	10 ml	80-1255-72
Immobiline II pK 7.0	10 ml	80-1255-73
Immobiline II pK 8.5	10 ml	80-1255-74
Immobiline II pK 9.3	10 ml	80-1255-75

For pricing information, visit www.gelifesciences.com/orderonline

Each bottle contains a ready-to-use 0.2 M solution
Store at 4–8°C
For Immobiline DryStrip Gels and IPG Buffers, see page 269

Pharmalyte

Pharmalyte carrier ampholytes, prepared by the co-polymerization of glycine, glycylglycine, amines, and epichlorohydrin, are available in five broad-range and four narrow-range pH intervals. Each interval contains numerous ampholytes with a high buffering capacity per pH unit. Pharmalyte carrier ampholytes form an extremely stable linear pH gradient exhibiting even conductivity across the gel. For precast PhastGel gels for PhastSystem, see page 299.

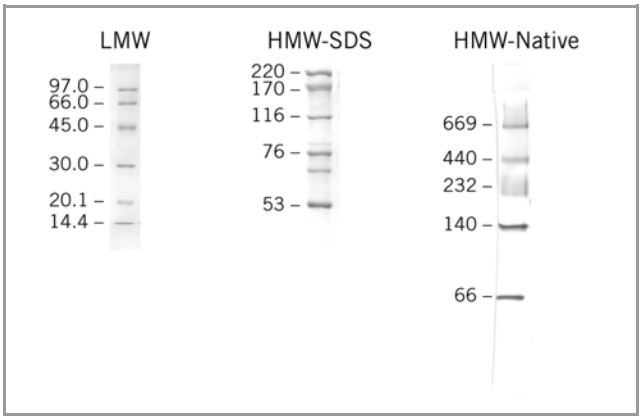
ORDERING INFORMATION

Product	Quantity	Code Number
Pharmalyte, broad range pH 2.5-5	25 ml	17-0451-01
Pharmalyte, broad range pH 4-6.5	25 ml	17-0452-01
Pharmalyte, broad range pH 5-8	25 ml	17-0453-01
Pharmalyte, broad range pH 8-10.5	25 ml	17-0455-01
Pharmalyte, broad range pH 3-10	25 ml	17-0456-01
Pharmalyte, narrow range pH 4.2-4.9	25 ml	17-0562-01
Pharmalyte, narrow range pH 4.5-5.4	25 ml	17-0563-01
Pharmalyte, narrow range pH 5-6	25 ml	17-0564-01
Pharmalyte, narrow range pH 6.7-7.7	25 ml	17-0566-01

For pricing information, visit www.gelifesciences.com/orderonline

Store at 4°C to 8°C
For new products in this area, please inquire at your local sales office

Protein and Peptide Molecular Weight Markers



LMW: A 3-µl aliquot of a two-fold dilution of LMW Marker Kit was separated on a 15% T, 2.7% C polyacrylamide gel.
HMW-SDS: A 10-µl aliquot of a two-fold dilution of HMW-SDS Marker Kit was separated on 7.5% T, 2.7% C polyacrylamide gel.
HMW-Native: A 10-µl aliquot of a two-fold dilution of HMW Marker Kit was separated on 5–12.5% polyacrylamide gradient gel. All gels were stained with PhastGel Blue R. Numbers represent molecular weights (M_r) in thousands.

ORDERING INFORMATION

Product	Quantity	Code Number
Peptide Marker Kit	1 vial, 2 mg/vial	**80-1129-83**
LMW-SDS Marker Kit	10 vials, 575 µg/vial	**17-0446-01**
HMW-SDS Marker Kit	10 vials, 175 µg/vial	**17-0615-01**
HMW Native Marker Kit	10 vials, 250 µg/vial	**17-0445-01**

For pricing information, visit www.gelifesciences.com/orderonline

Unopened vials should be stored at 4°C

Related Products	Refer To
miniVE Vertical Electrophoresis System	page 283
SE 600 Ruby and SE 660 Dual Cooled Vertical Units	page 287

- ***Determine molecular weight of uncharacterized protein samples with precision by comparison with carefully selected standards.***
- Get clear, sharp bands for easy measurement of migration distances.
- Bands can be visualized by using Deep Purple Total Protein Stain, Coomassie Brilliant Blue, or silver staining.

TECHNICAL SPECIFICATIONS

Protein	M_r	Source	Reference	Amount (µg)
Peptide Marker Kit (2512–16949)				
Horse myoglobin peptides	16949	equine		
	14404	equine		
	10700	equine		
	8159	equine		
	6214	equine		
	2512	equine		
HMW-SDS (53000–220000)				
Myosin	220000	rabbit muscle	1	25
α-2-Macroglobulin	170000	bovine plasma	2	100
β-Galactosidase	116000	*E. coli*	3	16
Transferrin	76000	human	4	17
Glutamate dehydrogenase	53000	bovine liver	5	18
LMW (14000–97000)				
Phosphorylase b	97000	rabbit muscle	6	67
Albumin	66000	bovine serum	7	83
Ovalbumin	45000	chicken egg white	8	147
Carbonic anhydrase	30000	bovine erythrocyte	9	83
Trypsin inhibitor	20100	soybean	10	80
α-Lactalbumin	14400	bovine milk	11	116
HMW Native (66000–669000)				
Thyroglobulin	669000	porcine thyroid	12	76
Ferritin	440000	equine spleen	13	50
Catalase	232000	bovine liver	14	36
Lactate dehydrogenase	140000	bovine heart	15	48
Albumin	66000	bovine serum	7	40

References for technical specifications

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Protein Molecular Weight Markers and pI Markers

Amersham ECL Plex Fluorescent Rainbow Markers

For main product entry, see page 355.

Rainbow Molecular Weight Markers *IMPROVED*

- ***Monitor progress of protein electrophoresis and assess transfer efficiency and molecular weight of blotted proteins without staining.***
- High intensity, prestained multicolored bands allow distinction of closely related proteins.
- Full-Range Rainbow Markers (M_r 12 000 to 225 000) use ten separate proteins with six different colors.
- High-Range Rainbow Markers (M_r 12 000 to 225 000) use eight separate proteins with six different colors.
- Low-Range Rainbow Markers (M_r 3500 to 38 000) use seven separate proteins with five different colors.
- For use on SDS-PAGE.

Rainbow Molecular Weight Markers have been enhanced to enable faster and simpler identification of proteins on SDS-polyacrylamide gels. The ready-to-load markers provide sharper, more intense bands on gels and blots and have improved band spacing for more accurate molecular weight determination. The bright, distinctive colors of the markers allow easier confirmation of transfer to blotting membranes and orientation.

Rainbow Molecular Weight Markers comprise a mixture of individually colored proteins that are combined to produce bands of equal color intensity. The approximate protein concentration is 1 to 2 mg/ml, depending on the product. Each 250 µl pack size is sufficient for use with 50 minigels (10 x 8 cm) or 25 large gels (20 x 20 cm).

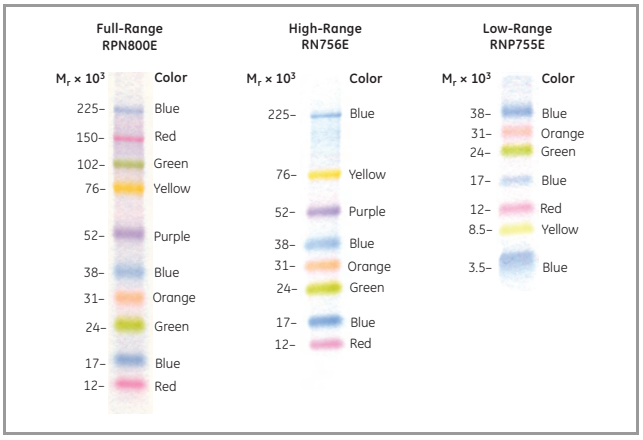
ORDERING INFORMATION

Product	Quantity	Code Number
Full-Range Rainbow Molecular Weight Markers *IMPROVED*	250 µl	**RPN800E**
High-Range Rainbow Molecular Weight Markers *IMPROVED*	250 µl	**RPN756E**
Low-Range Rainbow Molecular Weight Markers *IMPROVED*	250 µl	**RPN755E**

For pricing information, visit www.gelifesciences.com/orderonline

Store at -15°C to -30°C

Related Products	Refer To
Amersham ECL Plex Fluorescent Rainbow Markers	page 355
Amersham ECL DualVue Western Blotting Markers	page 317
miniVE Vertical Electrophoresis System	page 283
SE 600 Ruby and SE 660 Dual Cooled Vertical Units	page 287
ImageQuant Imagers	page 384



Rainbow Molecular Weight Markers are available in three size ranges for use with SDS-PAGE.

Amersham ECL DualVue Western Blotting Markers

- ***Detect proteins on gel and membrane as well as on film.***
- Prestained markers indicate efficiency of protein transfer to membrane and blot orientation.
- Tagged recombinant protein markers allow accurate calculation of molecular weight of target protein(s).
- Product is compatible with any HRP substrate as well as both PVDF and nitrocellulose membrane types.

Amersham ECL DualVue Western Blotting Markers perform two key functions. First, the prestained marker proteins confirm protein transfer in addition to clearly defining blot orientation. Second, the recombinant tagged proteins are detected on film or by CCD imaging in conjunction with the target protein(s) of interest, enabling highly accurate molecular mass determination of the target protein(s). The tagged markers are detected easily and specifically by means of a specific conjugate that eliminates any cross contamination between target protein(s) and markers.

Amersham ECL DualVue Western Blotting Markers contain a mixture of three prestained colored markers of defined molecular weight (from 15000 to 100000) and seven tagged recombinant proteins (molecular weights from 15000 to 150000). Each pack contains ECL DualVue markers (125 µl) and S-protein-HRP conjugate (50 µl), sufficient for 25 standard gel loadings.

TECHNICAL SPECIFICATIONS

Protein	M_r	Source	Amount (µg), approx.
Pre-Stained Indicator Proteins			
Phosphorylase b	100000	Rabbit Muscle	50
Myoglobin	16000	Horse Muscle	50
Lysozyme	15000	Chicken Egg White	50
Recombinant Tagged Proteins			
Recombinant protein	150000		1
Recombinant protein	100000		1
Recombinant protein	75000		1
Recombinant protein	50000		1
Recombinant protein	35000		1
Recombinant protein	25000		1
Recombinant protein	15000		1

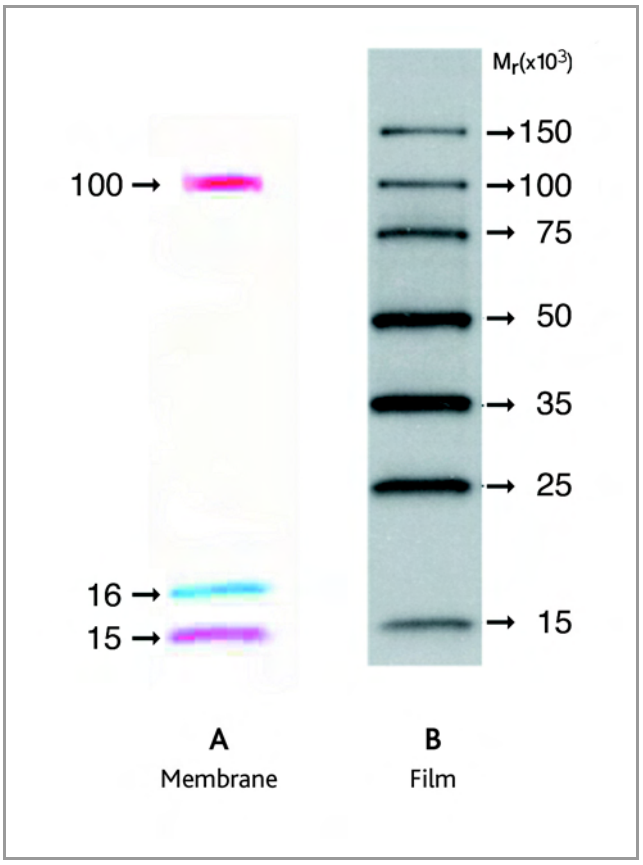
ORDERING INFORMATION

Product	Quantity	Code Number
ECL DualVue Western Blotting Markers*	1 pack (25 loadings)	**RPN810**

For pricing information, visit www.gelifesciences.com/orderonline

** Contains ECL DualVue Markers (125 µl) and S-protein-HRP (50 µl)*

Related Products	Code Number	Refer To
ECL Western Blotting Detection Reagents	RPN2106	page 357
ECL Plus Western Blotting Detection Reagents	RPN2132	page 356
ECL Advance Western Blotting Detection Kit	RPN2135	page 355
Amersham ECL-HRP Linked Secondary Antibodies		page 360
Rainbow Molecular Weight Markers *IMPROVED*		page 316



ECL DualVue Western Blotting Markers after electrophoresis on a 4–20% SDS-PAGE slab gel and transfer onto Hybond ECL nitrocellulose membrane. Prestained indicator proteins are shown as a photograph of the membrane (A), together with tagged recombinant proteins after detection with ECL Western Blotting Detection Reagents as a photograph of the film (B). Electrophoresis performed for 45 min at 200 V, 1 min film exposure.

Protein Molecular Weight Markers and pI Markers

Amersham ECL Western Blotting Molecular Weight Markers

- ***Biotinylated marker proteins with defined molecular weights in the range 14400 to 97000 enable molecular weight determination in Western blots.***
- Markers, when incubated with Streptavidin-HRP, are visualized using a luminol-based, light-producing reaction generated with ECL detection reagents.
- The protein mix (total concentration 1 mg/ml) is supplied in 50% glycerol and requires dilution in SDS-PAGE loading buffer. Storage is at -15°C to -30°C.

TECHNICAL SPECIFICATIONS

Protein	M_r	Source	Reference*
Phosphorylase b	97000	rabbit muscle	6
Albumin	66000	bovine serum	7
Ovalbumin	45000	chicken egg white	8
Carbonic anhydrase	31000	human erythrocyte	19
Trypsin inhibitor	20100	soybean	10
Lysozyme	14400	chicken egg white	16

** For references, see page 315*

ORDERING INFORMATION

Product	Quantity	Code Number
ECL Western Blotting Molecular Weight Markers	1 pack (25 loadings)	**RPN2107**
ECL Protein Molecular Weight Markers with Strep-HRP	1 pack	**RPN2280**

For pricing information, visit www.gelifesciences.com/orderonline

Related Products	Refer To
Streptavidin-Enzyme Conjugates	page 360
Amersham Hybond ECL	page 352
Amersham Hybond-P	page 352
Amersham Hyperfilm ECL	page 390
Amersham ECL Western Blotting Detection Reagents	page 357
Amersham ECL Plus Western Blotting Detection Reagents	page 356
miniVE Vertical Electrophoresis System	page 283

Protein Molecular Weight Standards

- ***Protein molecular weight standards in the range 6500–205000.***
- Sufficient material for 200 gel lanes.
- Bands can be visualized by using Deep Purple Total Protein Stain, Coomassie Brilliant Blue, or silver staining.
- The protein mix (total concentration 60 µg/ml) is supplied in storage solution containing 50% (v/v) glycerol. Store at -15°C to -30°C.

ORDERING INFORMATION

Product	Quantity	Code Number
Protein Molecular Weight Standards: (Broad range: MW 6500 to 205000)	400 µl	**RPN5800**

For pricing information, visit www.gelifesciences.com/orderonline

TECHNICAL SPECIFICATIONS

Protein	M_r	Source
Myosin	205000	rabbit muscle
β-Galactosidase	116000	*Escherichia coli*
Phosphorylase b	97000	rabbit muscle
Transferrin	80000	human serum
Albumin	66000	bovine serum albumin
Glutamate dehydrogenase	55000	bovine liver
Ovalbumin	45000	chicken egg white
Carbonic anhydrase	30000	bovine erythrocyte
Trypsin inhibitor	21000	soybean
Lysozyme	14000	chicken egg white
Aprotinin	6500	bovine lung

** Under non-denaturing conditions the 2500 and 3500 will not be observed.*

[^{14}C] Protein Molecular Weight Markers

- ***Carbon-14 radiolabeled marker proteins enable molecular weight determination of the sample on Western blots.***
- The Rainbow-labeled version also allows visual monitoring of band migration in the gel and on the blot.
- The specific activity of the [^{14}C] version without Rainbow-labeling is 0.37–3.7 MBq/mg (10–100 µCi/mg) or 185 kBq/ml (5 µCi/ml), supplied in aqueous buffer.
- The specific activity of the Rainbow-labeled version is 0.37–3.7 MBq/mg (10–100 µCi/mg) or 148 kBq/ml (4 µCi/ml) supplied in 50% glycerol.

SELECTION GUIDE – [^{14}C] Protein Molecular Weight Markers

Protein	M_r	CFA626	CFA645*	CFA755	CFA756
Myosin	220000	•			•
Phosphorylase b	97000	•			•
BSA	66000	•			•
Ovalbumin	45000	•		•	•
Carbonic anhydrase	30000	•	•	•	•
Trypsin inhibitor	20100		•	•	•
Lysozyme	14300	•		•	•
Cytochrome c	12500		•		
Aprotinin	6500		•	•	
Insulin B chain	3500		•	•	
Insulin A chain	2500		•	•	

** Under non-denaturing conditions the 2500 and 3500 will not be observed.*

ORDERING INFORMATION

Product	Quantity	Code Number
[^{14}C] Methylated Protein Molecular Weight Markers	37 kBq, 1 µCi	CFA626-1UCI
[^{14}C] Methylated Protein Molecular Weight Markers	185 kBq, 5 µCi	CFA626-5UCI
[^{14}C] Methylated Protein Molecular Weight Markers	37 kBq, 1 µCi	CFA645-1UCI
Rainbow [^{14}C] Methylated Protein Markers	37 kBq, 1 µCi	CFA755-1UCI
Rainbow [^{14}C] Methylated Protein Markers	37 kBq, 1 µCi	CFA756-1UCI

For pricing information, visit www.gelifesciences.com/orderonline

Store at -20°C

Related Products	Refer To
Amersham Hybond ECL	page 352
Amersham Hybond-P	page 352

pI Markers

TECHNICAL SPECIFICATIONS

Components of pI Calibration Kits

Kit	Protein	pI (Native)
Broad pI Kit (pI 3.5–9.3)*	Amylglucosidase	3.50
	Methyl red (dye)	3.75
	Trypsin inhibitor	4.55
	β-Lactoglobulin A	5.20
	Carbonic anhydrase B (bovine)	5.85
	Carbonic anhydrase B (human)	6.55
	Myoglobin, acidic band	6.85
	Myoglobin, basic band	7.35
	Lentil lectin, acidic	8.15
	Lentil lectin, middle	8.45
	Lentil lectin, basic	8.65
	Trypsinogen	9.30
Low pI Kit (pI 2.8–6.5)	Pepsinogen	2.80
	Amylglucosidase	3.50
	Methyl red (dye)	3.75
	Glucose oxidase	4.25
	Trypsin inhibitor	4.55
	β-Lactoglobulin A	5.20
	Carbonic anhydrase B (bovine)	5.85
	Carbonic anhydrase B (human)	6.55
High pI Kit (pI 5.2–10.3)*	β-Lactoglobulin A	5.20
	Carbonic anhydrase B (bovine)	5.85
	Carbonic anhydrase B (human)	6.55
	Myoglobin, acidic	6.85
	Myoglobin, basic	7.35
	Lentil lectin, acidic	8.15
	Lentil lectin, middle	8.45
	Lentil lectin, basic	8.65
	Trypsinogen	9.30
	Cytochrome c	10.25

** Measured at 24°C.*

ORDERING INFORMATION

Product	Quantity	Code Number
Broad pI Kit, pH 3-10	10 vials, 325 µg/vial	17-0471-01
Low pI Kit, pH 2.5-6.5	10 vials, 280 µg/vial	17-0472-01
High pI Kit, pH 5-10.5	10 vials, 280 µg/vial	17-0473-01
Carbamylyte Calibration Kit	1 kit	17-0582-01

For pricing information, visit www.gelifesciences.com/orderonline

Broad, Low and High pI kits are not for use in denaturing (urea) systems

Store at 4°C

Related Products	Code Number	Refer To
Multiphor II	18-1018-06	page 291

pI markers are lyophilized mixtures of stable, salt-free, highly purified proteins. The markers may be run in parallel with the experimental samples on isoelectric focusing gels. These markers are not prestained.

The precisely defined pI of the markers allows a permanent and accurate calibration of sample components. pH gradients and pI can be measured to within 0.01–0.05 pH unit. The progress of the focusing experiment can be monitored visually by the focusing of methyl red or Cytochrome c.

Carbamylyte Calibration Kit is intended for use with urea denaturing IEF gels and is particularly suitable as an internal standard in 2-D electrophoresis. Carbamylyte standards resolve into a chain of spots, all of the same molecular weight. The kit contains three different molecular weight standards.

TECHNICAL SPECIFICATIONS

Carbamylyte Calibration Kit

Protein	pI Range	No. of Vials
Creatine phosphokinase (≈ 34 spots)	4.9–7.1	4
Carbonic anhydrase (≈ 20 spots)	4.8–6.7	4
Glyceraldehyde-3-phosphate dehydrogenase (≈ 34 spots)	4.7–8.3	2

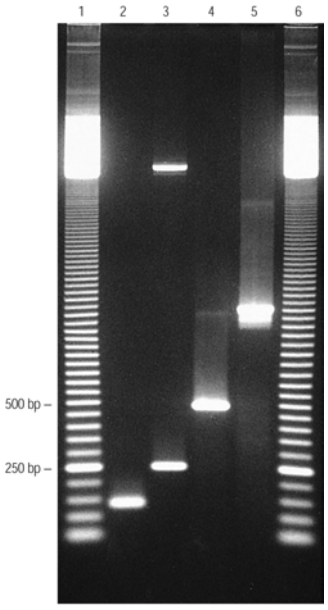
DNA Molecular Weight Markers

SELECTION GUIDE – DNA Markers			
Precise Sizing			Digest of Natural DNAs
50 Base-Pair Ladder 27-4005-01 (page this page)	100 Base-Pair Ladder 27-4007-01 (page 321)	KiloBase DNA Marker 27-4004-01 (page 321)	DRigest III 27-4060-01 (page 321)
500 *	2000 *	10000	23130 †
450	1900	8000	9416
400	1800	6000	6557
350	1700	5000	4361†
300	1600	4000	2322
250	1500	3000	2027
200	1400	2500	1353
150	1300	2000	1078
100	1200	1500	872
50	1100	1000	603
	1000	500	564 ‡
	900		310
	800		281
	792		271
	700		234
	600		194
	500		125 ‡
	400		118
	300		72
	200		
	100		

** Not necessarily the largest size fragment possible, only the largest that is readily distinguishable*
† Cos ends located on these bands
‡ Very faint band

SELECTION GUIDE – DNA Markers			
Marker Code Number	Recommended Gel	Loading Amount (µg/lane)	Heat Before Loading
27-4005-01	2% agarose/6% polyacrylamide	2.0	No
27-4007-01	1.5% agarose	2.0	No
27-4004-01	0.8% agarose	0.5	No
27-4060-01	1% agarose	0.5–1.0	60°C to 65°C for 2 min

50 Base-Pair Ladder



50 Base-Pair Ladder and four DNA samples were analyzed on a 2% agarose gel with TAE as the running buffer. Bands were visualized under UV light after staining with ethidium bromide. Lane 1, 50 Base-Pair Ladder; lane 2, 137 bp PCR product; lane 3, plasmid digested to completion with AvaI to release a 250-bp fragment; lane 4, 504 bp PCR product; lane 5, 887-bp PCR product; lane 6, 50 Base-Pair Ladder.

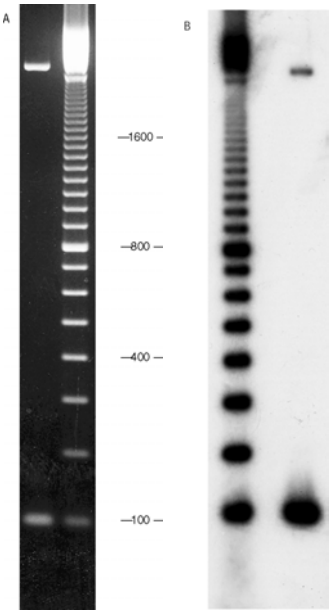
ORDERING INFORMATION		
Product	Quantity	Code Number
50 Base-Pair Ladder	200 µg	27-4005-01

For pricing information, visit www.gelifesciences.com/orderonline

Related Products	Refer To
Nucleic Acid Electrophoresis	page 300

- ***For precise sizing of average-sized PCR products and other DNAs from 50 to 500 bp on agarose gels.***
- Supplied at 1 µg/µl in TE buffer (pH 7.5) in sufficient quantity for 100 loadings using 2 µl per loading after mixing with tracking dye.
- Consists of multiple repeats of a 50-bp fragment; resolves to at least 10 distinguishable bands, each separated by 50-bp increments when run on a 2% agarose gel.
- Can be visualized by ethidium bromide staining or by autoradiography (after radiolabeling).
- Bands stain uniformly with ethidium bromide, except for the 250-bp band, which is approximately twice as intense as the other bands.
- Not designed for quantitating DNA content in a sample.

100 Base-Pair Ladder



100 Base-Pair Ladder visualized by fluorescence with ethidium bromide (A) and autoradiography (B). Panel A: 2 µg of Ladder was analyzed on a 1.5% agarose gel with TBE containing ethidium bromide as running buffer. Panel B: 2 µg of Ladder was labeled with [α-^{32}P]dCTP using a fill-in reaction. Approximately 0.5 µg of labeled Ladder was analyzed on a 1.5 % agarose gel.

ORDERING INFORMATION

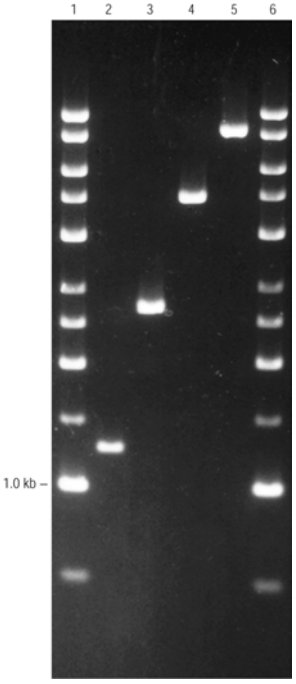
Product	Quantity	Code Number
100 Base-Pair Ladder	100 µl	27-4007-01

For pricing information, visit www.gelifesciences.com/orderonline

Related Products	Refer To
Nucleic Acid Electrophoresis	page 300

- ***For precise sizing of double-stranded DNA fragments from 100 to 2000 bp on agarose gels.***
- Supplied in sufficient quantity for 50 loadings using 2 µl per loading after mixing with tracking dye.
- Consists of multiple repeats of a 100-bp fragment; resolves to 20 or more readily distinguishable bands, each separated by 100 bp increments when run on a 1.5% agarose gel.
- Can be visualized by ethidium bromide staining or by autoradiography (after radiolabeling).
- Bands stain uniformly with ethidium bromide, except for the 800-bp band, which is approximately twice as intense as the other bands.
- Not designed for quantitating DNA content in a sample.

KiloBase DNA Marker



KiloBase DNA Marker and four DNA samples were analyzed on a 0.8% agarose gel with TAE containing ethidium bromide as running buffer. Bands were visualized under UV light. Lane 1, 0.5 µg KiloBase DNA Marker; lane 2, 100 ng Kan GenBlock (1282 bp); lane 3, 100 ng pUC18 SmaI/BAP (2686 bp, 27-4860-01); lane 4, 100 ng pGEX-4T-3 (4900 bp, 27-4583-01); lane 5, 100 ng pMSG-CAT (8405 bp, 27-4505-01); lane 6, 0.5 µg KiloBase DNA Marker.

ORDERING INFORMATION

Product	Quantity	Code Number
KiloBase DNA Marker	50 µg	27-4004-01

For pricing information, visit www.gelifesciences.com/orderonline

Related Products	Refer To
Nucleic Acid Electrophoresis	page 300

- ***For quick and precise sizing of double-stranded DNA fragments from 500 bp to 10.0 kb on agarose gels.***
- Supplied at 0.5 µg/µl in TE buffer (pH 8.0) in sufficient quantity for 100 loadings using 1 µl per loading after mixing with tracking dye.
- Consists of 11 easily-identifiable bands—0.5, 1.0, 1.5, 2.0, 2.5, 3.0, 4.0, 5.0, 6.0, 8.0, and 10.0 kb—when run on a 0.8% agarose gel.
- Bands stain with approximately the same intensity, except for the 1.0-kb band, which is three times the intensity of the other bands.
- Not designed for quantitating DNA content in a sample.

Restriction Digests of Naturally Occurring DNAs

- ***For sizing DNA fragments from 72 to 23130 bp on agarose gels.***
- Contains either λ DNA, ϕX-174 RF DNA or a combination of the two substrates which have been digested with restriction enzymes.
- DRIgest III (27-4060-01) is supplied in a convenient, dried form to allow the user to adjust the concentration.

A complete list of fragment sizes can be found in the Selection Guide, see page 320.

ORDERING INFORMATION

Product	Quantity	Code Number
DRIgest III (λ DNA-*Hind* III/ϕX-174 RF DNA-*Hae* III Digest)	25 µg	27-4060-01
ϕX-174 RF DNA-*Hae* III Digest	100 µg	27-4044-02

For pricing information, visit www.gelifesciences.com/orderonline

Related Products	Refer To
Nucleic Acid Electrophoresis	page 300